

The background of the cover is a photograph of a modern building. The building has a facade made of horizontal wooden slats and large windows. Some windows are framed in red, while others are framed in white. The building is elevated on several thick, grey, cylindrical columns. The sky is a clear, bright blue.

# SFS

## Specification Manual





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# Investing in quality and service

## The Company

Metsec plc is the UK's largest specialist cold roll-forming company, providing structural steel components for the UK construction and manufacturing industries. We have been established for over 75 years and are based in Oldbury in the West Midlands. Today, Metsec are part of the Profilform Division of voestalpine – the world's largest manufacturer of cold rolled sections.

voestalpine is a leading European manufacturer with its own steelmaking facilities and headquarters in Austria. The five divisions of voestalpine; Steel, Special

Steel, Railway Systems, Automotive and Profilform, all occupy top positions within their respective markets.

We focus on adding value through expert design, precision manufacturing and on-time, in-full product delivery. Our aim is to provide excellent service and quality products that offer our customers cost effective solutions.



### Metsec's Lightweight Structural Systems

guarantee expert design and cost effective bespoke high quality solutions to the construction industry.

Our unrivalled customer support package includes taking the structural design responsibility from the customer at the outset.

Our highly experienced technical team of engineers will then produce detailed designs which are covered by our Professional Indemnity insurance. Similarly, our manufacturing capacity ensures the fast and accurate supply of materials to site ready for installation enabling our customers to meet the tightest building programmes.

#### Purlin Division

Metsec's Purlin Division is the UK's largest designer and manufacturer of light gauge galvanised steel purlins, side rails and mezzanine floor systems for use in a wide range of industrial and commercial developments. Our systems are manufactured from 450N/mm<sup>2</sup> guaranteed yield strength material for greater strength and reduced project weights. Metsec Z & C sections are available in profile heights from 142mm to 342mm and thicknesses from 1.3mm to 3.0mm and are available with a full range of accessories.

#### SFS Division

Metsec's Steel Framing System (SFS) Division leads the market when it comes to light gauge galvanised steel structural framing designs and is suitable for a wide range of applications in most market sectors of construction. SFS is a fast track cold rolled steel frame system which is site fixed as infill or continuous walling, high bay separating walls or load bearing structures.

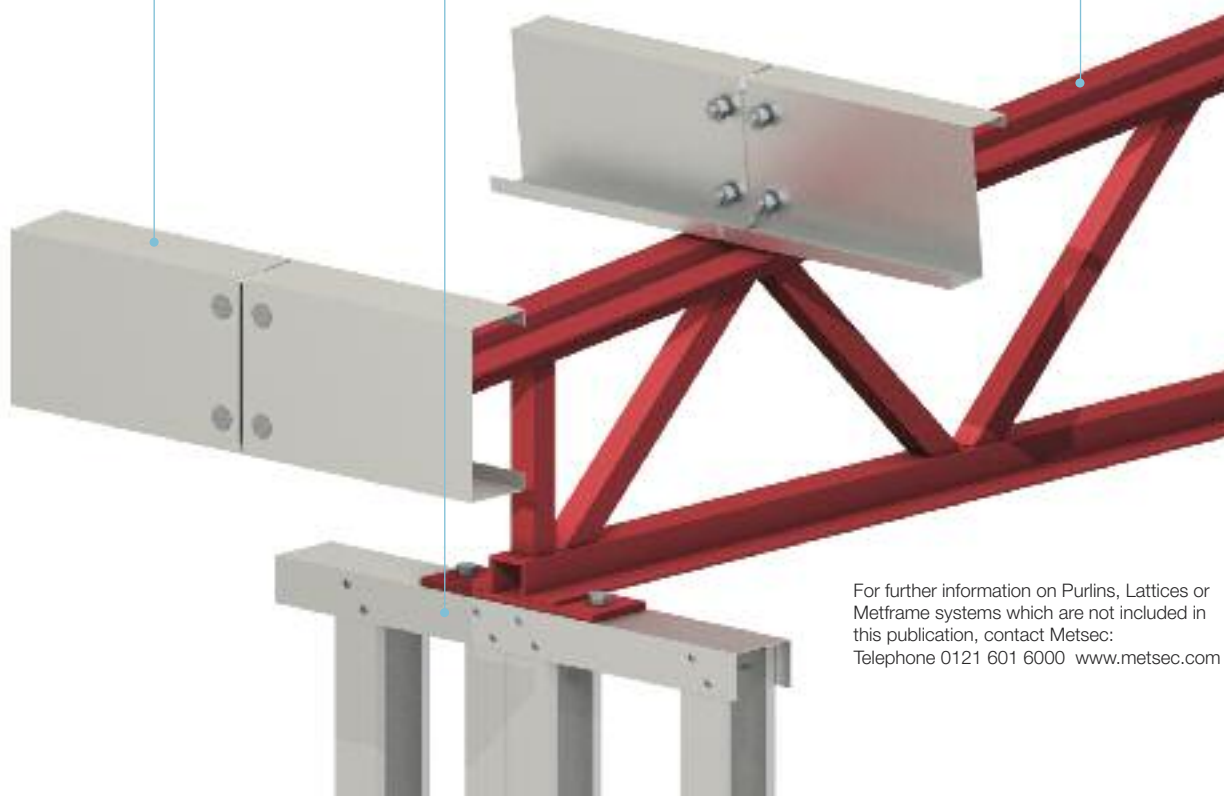
SFS provides a pre-engineered solution in line with the demands of modern methods of construction and is structurally proven and independently tested to provide thermal, acoustic and fire resistance performance.

#### Metframe Division

Metsec's Metframe Division provides a pre-panelised framing system that is fabricated off site. Panels are then installed on site with either concrete or cold-rolled steel joisted floors added to create a complete stand alone structure. The use of prefabricated panels allows the efficient erection of the structure and aids the main contractor in reducing the overall on-site programme

#### Lattice Beam Division

Metsec's Lattice Beam Division is the UK's largest manufacturer of lightweight steel lattice joists, trusses and beams, including parallel, pitched, tapered and curved designs with spans up to 40 metres. Lightweight and easy to handle, they offer ideal structural support with optimum strength to weight ratio. The open web configuration allows for the easy passage of services.



For further information on Purlins, Lattices or Metframe systems which are not included in this publication, contact Metsec:  
Telephone 0121 601 6000 [www.metsec.com](http://www.metsec.com)

## Quality

Metsec operates strict design and quality procedures through a Quality Management System accredited to BS EN ISO 9001:2000 which covers both our design and manufacturing operations.

This commitment to quality ensures that we provide the highest levels of performance throughout our operations, ensuring the highest level of customer satisfaction.

## Design

Our market leading FrameSPEC design software provides cost effective solutions to maximise the design efficiency of structures, whilst saving the professional team valuable time when specifying our products. Comprehensive technical support is provided by our design office.

For full details on our technical support service and how to obtain a free copy of FrameSpec, please refer to pages 38-39.

## Sustainability

### Certification

Metsec and voestalpine both regard the issue of sustainability as a core social, as well as corporate, responsibility.

This has been recognised by the award of BS EN ISO 14001:2004 for our Environmental Management System.

**Metsec were the first cold roll-forming company to be awarded the prestigious Gold Standard under the Steel Construction Sustainability Charter.**

Additionally, Metsec recognise that environmental responsibility is both a local as well as a global issue. We were therefore pleased to be awarded the Sandwell Borough Platinum Environmental Charter Award following an audit of our Environmental management procedures and award of BS EN ISO 14001:2004.

### Re-use and recycling

Steel is one of the world's most recycled materials with a potential recovery and re-use factor of up to 94%\*.

SFS is also substantially lighter than traditional alternatives, allowing the possibility of reducing the loads on the primary frame and sub-structure.

These factors combine to offer a reduction in the overall carbon footprint of the building.

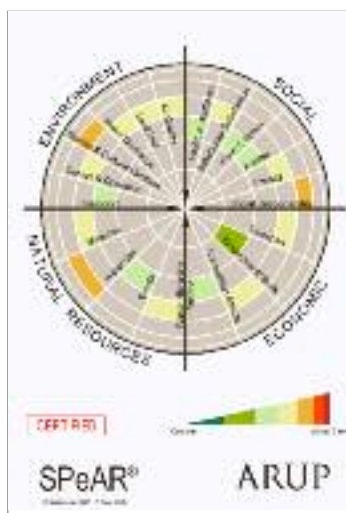
\* BCSA publication no. 35/03

### SPeAR®

Independently, as well as with voestalpine, Metsec will continue to pursue sustainability as a key business objective. The cornerstone of this is the very thorough and detailed societal, economic and environmental sustainability review of our operations carried out in the SPeAR® (Sustainable Project Appraisal Routine) Report from Arup. This report gives us both an assessment of our current environmental position as well as identifying key areas for improvement in the future.

To quote from the report:

**"The baseline SPeAR® diagram shows a well balanced performance in terms of sustainability, and that Metsec is already meeting legislation or best practice in the large majority of areas. In some cases Metsec is starting to move beyond best practice."**



# Choosing the right SFS application

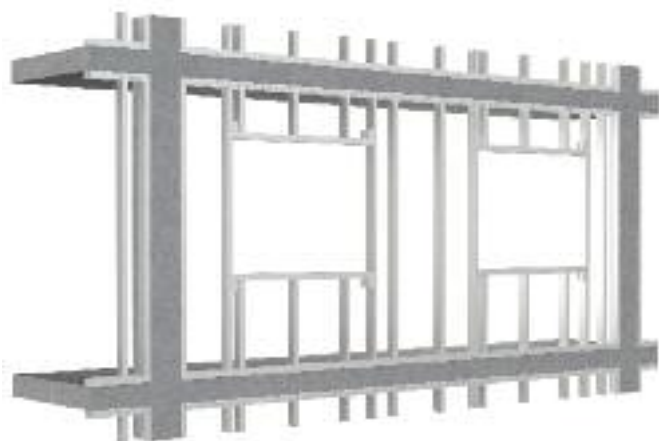
Metsec produce a wide range of sections which our designers can use within four clearly defined building applications to suit many construction requirements.

Cold-rolled galvanized steel sections are typically supplied to site as individual components which are assembled in-situ using Tek screwed connections. Components can be manufactured cut to length or supplied in standard lengths which are then cut to suit on site.

Metsec SFS is an extremely versatile product and has many advantages over traditional or timber frame construction:

- Fast track construction aids the overall construction programme.
- Lightweight construction reduces loads on the primary structural frame and sub-structure design.
- Cutting components to length on site means tolerances in the structures primary structural frame can be accommodated.
- In-situ assembly is advantageous on sites with access/craneage restrictions.

## Infill walling - see pages 10-11



A Metsec base track is fixed onto the slab of the primary structural frame. Metsec's slotted head tracks are then fixed to the underside of the slab or structure to allow for deflection, and studs are then cut, aligned and fixed into position with Tek screws at regular centres to provide support for internal and external finishes.

## Continuous walling - see pages 12-13



This system is fitted outside the primary structural frame. Support is required for the system's base track. Studs are then built multiple storeys tall. These are restrained using cleats with slotted connections at each slab level. Each lift of studs is capped with a track which provides support for the next base track and lift of studs over.

- High thermal and acoustic performance. Foil faced insulation is fitted externally which can be enhanced using insulation in the stud cavity.
- Support/restraint can be provided for most external cladding materials.
- Early weather protection is achieved to the building.
- Wet trades on site are minimized.
- Shrinkage/warping problems associated with timber frames do not apply to steel frames.
- Precision engineered components reduce building maintenance.
- Design/detailing service and technical back-up is provided throughout the process.
- Projects are underwritten by Metsec's Professional Indemnity Cover.
- Excellent sustainability characteristics.
- Proven track record

### High-bay separating walls - see pages 14-15



This is a fast-track, high performance, single span separating wall system. Its lightweight construction and uniformly distributed loads normally mean that the system can be used within existing structures without the need to strengthen foundations or slabs.

### Load-bearing structures - see pages 16-17



Metsec can design and supply a complete load bearing superstructure for low to medium rise structures. Our Technical Department provides details to allow SFS sections to be assembled in-situ to provide walls, floors and roofs. The lightweight characteristics make roof top extensions to existing structures for penthouse apartments, a common application for this system.

# SFS – Components

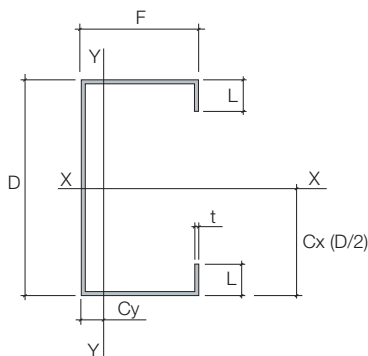
Metsec SFS relies on high quality, purpose designed components. The design of sections draws on Metsec's extensive cold rolling knowledge to maximise the strength to weight ratios. Where necessary, the Metsec SFS range of sections can be used in conjunction with other ranges produced by Metsec.

The table opposite shows the standard section range for SFS.

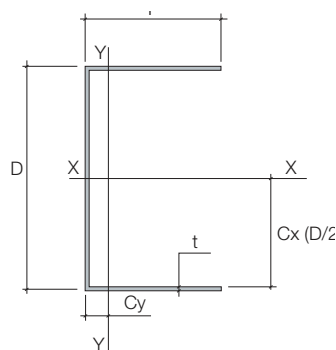
These consist of the section profiles listed below:



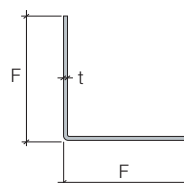
Stud being fixed to slotted head track.



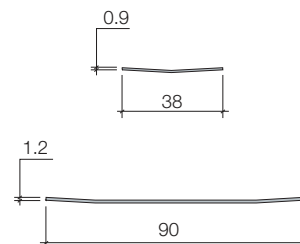
**'C sections':** Used as studs in wall panels and joists in floor/roof panels.



**'Channels':** Used as tracks on the top and bottom of wall panels and ends of floor/roof panels.

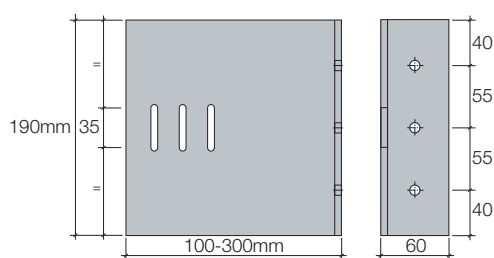
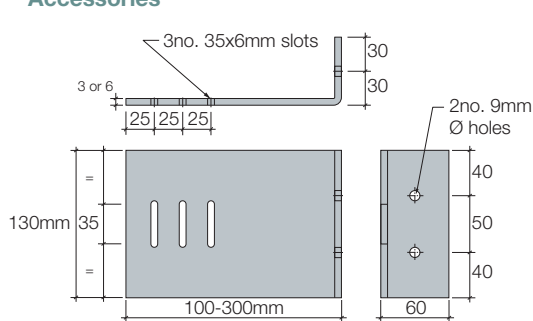


**'Angles':** Used for various arrangements to provide additional or temporary support.



**'Straps':** These are available to use as bracing members when screw fixed to the face of panels.

## Accessories

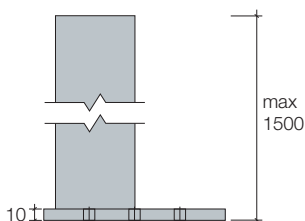
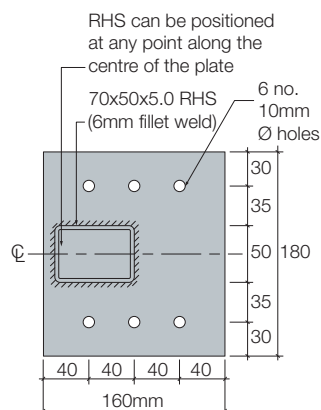


### Continuous walling cleats (slotted)

3m thick - Ref. CW1303 x (100 - 300)  
or CW1903 x (100 - 300)  
6m thick - Ref. CW1306 x (100 - 300)  
or CW1906 x (100 - 300)

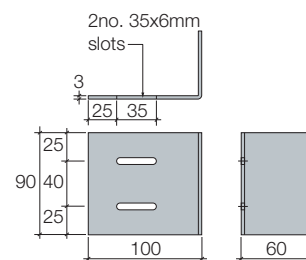
### Dead load cleats (no slots)

3m thick - Ref. DL1303 x (100 - 300)  
or DL1903 x (100 - 300)  
6m thick - Ref. DL1306 x (100 - 300)  
or DL1906 x (100 - 300)



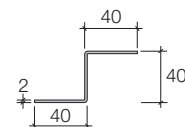
### Cantilever posts

Ref. CP705050



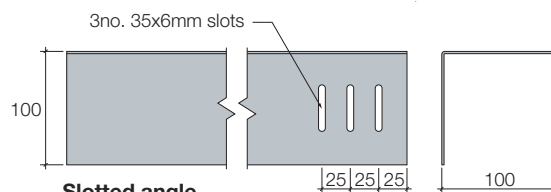
### High load cleats

Slotted - Ref. HS903  
Plain - Ref. HL903



### Zed bars

Ref. Z402  
Supplied in 600mm lengths



### Slotted angle

Ref. SA1002  
Supplied in 1000mm lengths

All cleats, zed bars and slotted angles are manufactured from pre-hot dipped galvanised steel.



# Section properties

## Section sizes and properties

| Section Ref | Area cm <sup>2</sup> | Weight kg/m | D mm | F mm | L mm | t mm | Cy cm | Ixx cm <sup>4</sup> | Iyy cm <sup>4</sup> | Zxx cm <sup>3</sup> | Zxc cm <sup>3</sup> | rx cm | ry cm | Po N/mm <sup>2</sup> | Q     | es cm |
|-------------|----------------------|-------------|------|------|------|------|-------|---------------------|---------------------|---------------------|---------------------|-------|-------|----------------------|-------|-------|
| 70M15       | 2.31                 | 1.83        | 70   | 35   | 10   | 1.5  | 1.21  | 18.3                | 3.92                | 5.22                | 5.22                | 2.81  | 1.30  | 280                  | 0.971 | 0.03  |
| 100M12      | 2.75                 | 2.14        | 100  | 53   | 14   | 1.2  | 1.84  | 45.9                | 11.07               | 9.18                | 8.70                | 4.08  | 2.01  | 273                  | 0.762 | 0.37  |
| 100M15      | 3.45                 | 2.67        | 100  | 54   | 14   | 1.5  | 1.88  | 57.4                | 14.21               | 11.49               | 11.32               | 4.08  | 2.03  | 280                  | 0.863 | 0.24  |
| 100M20      | 4.60                 | 3.56        | 100  | 55   | 15   | 2.0  | 1.92  | 76.1                | 19.21               | 15.21               | 15.20               | 4.07  | 2.04  | 280                  | 0.956 | 0.08  |
| 100M23*     | 6.04                 | 4.67        | 100  | 71   | 16   | 2.3  | 2.64  | 104.6               | 41.40               | 20.92               | 20.85               | 4.16  | 2.62  | 280                  | 0.976 | 0.05  |
| 100M29*     | 7.67                 | 5.83        | 100  | 72   | 16   | 2.9  | 2.71  | 131.1               | 53.58               | 26.22               | 26.22               | 4.14  | 2.64  | 280                  | 0.997 | 0.01  |
| 100M30*     | 10.56                | 8.26        | 100  | 110  | 22   | 3.0  | 4.65  | 192.3               | 172.10              | 38.45               | 37.89               | 4.27  | 4.04  | 280                  | 0.979 | 0.01  |
| 150M12      | 3.37                 | 2.64        | 150  | 55   | 13   | 1.2  | 1.56  | 118.3               | 13.44               | 15.77               | 14.98               | 5.92  | 2.00  | 250                  | 0.625 | 0.67  |
| 150M15      | 4.23                 | 3.37        | 150  | 56   | 13   | 1.5  | 1.60  | 148.2               | 17.24               | 19.76               | 19.44               | 5.92  | 2.02  | 264                  | 0.713 | 0.55  |
| 150M20      | 5.64                 | 4.47        | 150  | 57   | 13   | 2.0  | 1.64  | 196.8               | 23.31               | 26.23               | 26.19               | 5.91  | 2.03  | 277                  | 0.815 | 0.35  |
| 150M30*     | 8.76                 | 6.83        | 150  | 62   | 15   | 3.0  | 1.89  | 306.9               | 42.82               | 40.92               | 40.92               | 5.92  | 2.21  | 280                  | 0.955 | 0.08  |
| 200M12      | 3.97                 | 3.13        | 200  | 55   | 13   | 1.2  | 1.34  | 232.0               | 14.59               | 23.20               | 22.39               | 7.64  | 1.92  | 228                  | 0.536 | 0.88  |
| 200M15      | 5.28                 | 4.18        | 200  | 65   | 14   | 1.5  | 1.70  | 319.6               | 27.71               | 31.96               | 30.89               | 7.78  | 2.29  | 246                  | 0.607 | 0.86  |
| 200M20      | 7.08                 | 5.56        | 200  | 67   | 14   | 2.0  | 1.77  | 428.8               | 38.82               | 42.88               | 42.61               | 7.78  | 2.34  | 264                  | 0.707 | 0.66  |
| 200M30*     | 10.56                | 8.26        | 200  | 69   | 14   | 3.0  | 1.89  | 639.3               | 59.60               | 63.93               | 63.92               | 7.76  | 2.37  | 280                  | 0.851 | 0.30  |
| 250M16      | 6.55                 | 5.11        | 250  | 68   | 15   | 1.6  | 1.62  | 594.5               | 35.78               | 47.56               | 46.45               | 9.52  | 2.34  | 234                  | 0.558 | 1.04  |
| 250M20      | 8.16                 | 6.38        | 250  | 68   | 15   | 2.0  | 1.62  | 736.9               | 43.86               | 58.65               | 58.65               | 9.50  | 2.32  | 250                  | 0.626 | 0.88  |
| 300M20      | 8.80                 | 6.97        | 300  | 59   | 15   | 2.0  | 1.20  | 1060.3              | 32.22               | 70.68               | 70.64               | 10.98 | 1.91  | 237                  | 0.549 | 0.90  |
| 300M29      | 12.83                | 10.1        | 300  | 62   | 15   | 2.9  | 1.30  | 1548.3              | 50.35               | 103.22              | 103.22              | 10.99 | 1.98  | 262                  | 0.652 | 0.62  |
| 74M12       | 1.82                 | 1.47        | 74   | 40   | 0    | 1.2  | 1.08  | 16.4                | 2.99                | 4.43                | 3.37                | 3.00  | 1.28  | 280                  | 0.618 | -0.48 |
| 74M20       | 4.00                 | 3.26        | 74   | 65   | 0    | 2.0  | 2.15  | 39.4                | 18.18               | 10.65               | 8.06                | 3.14  | 2.13  | 280                  | 0.757 | -0.93 |
| 104M12      | 2.71                 | 2.14        | 104  | 62   | 0    | 1.2  | 1.73  | 49.8                | 10.96               | 9.58                | 6.11                | 4.29  | 2.0   | 271                  | 0.444 | -1.01 |
| 104M15      | 3.38                 | 2.67        | 104  | 62   | 0    | 1.5  | 1.74  | 61.7                | 13.60               | 11.87               | 8.18                | 4.28  | 2.01  | 280                  | 0.539 | -0.91 |
| 104M20      | 4.52                 | 3.56        | 104  | 63   | 0    | 2.0  | 1.80  | 82.2                | 18.70               | 15.81               | 12.29               | 4.26  | 2.03  | 280                  | 0.694 | -0.76 |
| 108M30*     | 6.78                 | 5.35        | 108  | 62   | 0    | 3.0  | 1.77  | 129.0               | 26.50               | 23.89               | 22.47               | 4.36  | 1.98  | 280                  | 0.911 | -0.30 |
| 154M12      | 3.33                 | 2.64        | 154  | 63   | 0    | 1.2  | 1.46  | 123.1               | 12.88               | 15.99               | 10.86               | 6.08  | 1.97  | 249                  | 0.346 | -0.83 |
| 154M20      | 5.64                 | 4.47        | 154  | 66   | 0    | 2.0  | 1.60  | 208.7               | 23.96               | 27.10               | 21.04               | 6.08  | 2.06  | 276                  | 0.533 | -0.69 |
| 158M30*     | 8.70                 | 6.83        | 158  | 69   | 0    | 3.0  | 1.72  | 336.4               | 40.03               | 42.58               | 38.32               | 6.22  | 2.15  | 280                  | 0.754 | -0.46 |
| 204M12      | 3.93                 | 3.13        | 204  | 63   | 0    | 1.2  | 1.25  | 237.4               | 13.88               | 23.27               | 16.66               | 7.77  | 1.88  | 226                  | 0.287 | -0.70 |
| 204M20      | 6.96                 | 5.56        | 204  | 74   | 0    | 2.0  | 1.63  | 435.2               | 35.55               | 42.67               | 32.42               | 7.91  | 2.26  | 263                  | 0.424 | -0.73 |
| 208M30*     | 10.38                | 8.26        | 208  | 72   | 0    | 3.0  | 1.59  | 659.8               | 48.66               | 63.44               | 56.07               | 7.97  | 2.17  | 280                  | 0.606 | -0.51 |
| 254M12      | 3.93                 | 3.13        | 254  | 38   | 0    | 1.2  | 0.49  | 305.0               | 3.47                | 24.01               | 20.75               | 8.81  | 0.94  | 204                  | 0.278 | -0.06 |
| 254M20      | 8.00                 | 6.38        | 254  | 79   | 0    | 2.0  | 1.59  | 762.0               | 45.13               | 60.00               | 45.66               | 9.66  | 2.35  | 249                  | 0.361 | -0.78 |
| 304M16      | 6.41                 | 5.11        | 304  | 53   | 0    | 1.6  | 0.75  | 750.6               | 12.25               | 49.38               | 41.77               | 10.74 | 1.37  | 216                  | 0.298 | -0.17 |
| 304M20      | 8.72                 | 6.97        | 304  | 68   | 0    | 2.0  | 1.13  | 1070.1              | 30.86               | 70.40               | 57.75               | 11.08 | 1.88  | 236                  | 0.343 | -0.39 |
| 306M29      | 12.65                | 10.1        | 306  | 68   | 0    | 2.9  | 1.16  | 1559.5              | 43.94               | 101.93              | 91.85               | 11.10 | 1.86  | 261                  | 0.475 | -0.19 |
| 38VB09      | 0.34                 | 0.27        | 38   | 0    | 0    | 0.9  |       |                     |                     |                     |                     |       |       |                      |       |       |
| 90VB12      | 1.20                 | 0.85        | 90   | 0    | 0    | 1.2  |       |                     |                     |                     |                     |       |       |                      |       |       |
| 45x45x2.0   | 1.76                 | 1.38        | 0    | 45   | 0    | 2.0  |       |                     |                     |                     |                     |       |       |                      |       |       |
| 100x100x2.0 | 3.96                 | 3.11        | 0    | 100  | 0    | 2.0  |       |                     |                     |                     |                     |       |       |                      |       |       |

\* Non-Standard section sizes. Availability and lead-in times may vary from typical periods.

Slotted head track is available on certain gauges for the 104mm, 154mm and 204mm sections using an 'S' suffix.

Properties are for single studs and track sections.

Sizes are nominal.

'es' = Shift in neutral axis due to axial load. Positive value means axis shifts away from web.

### Examples of section references are:

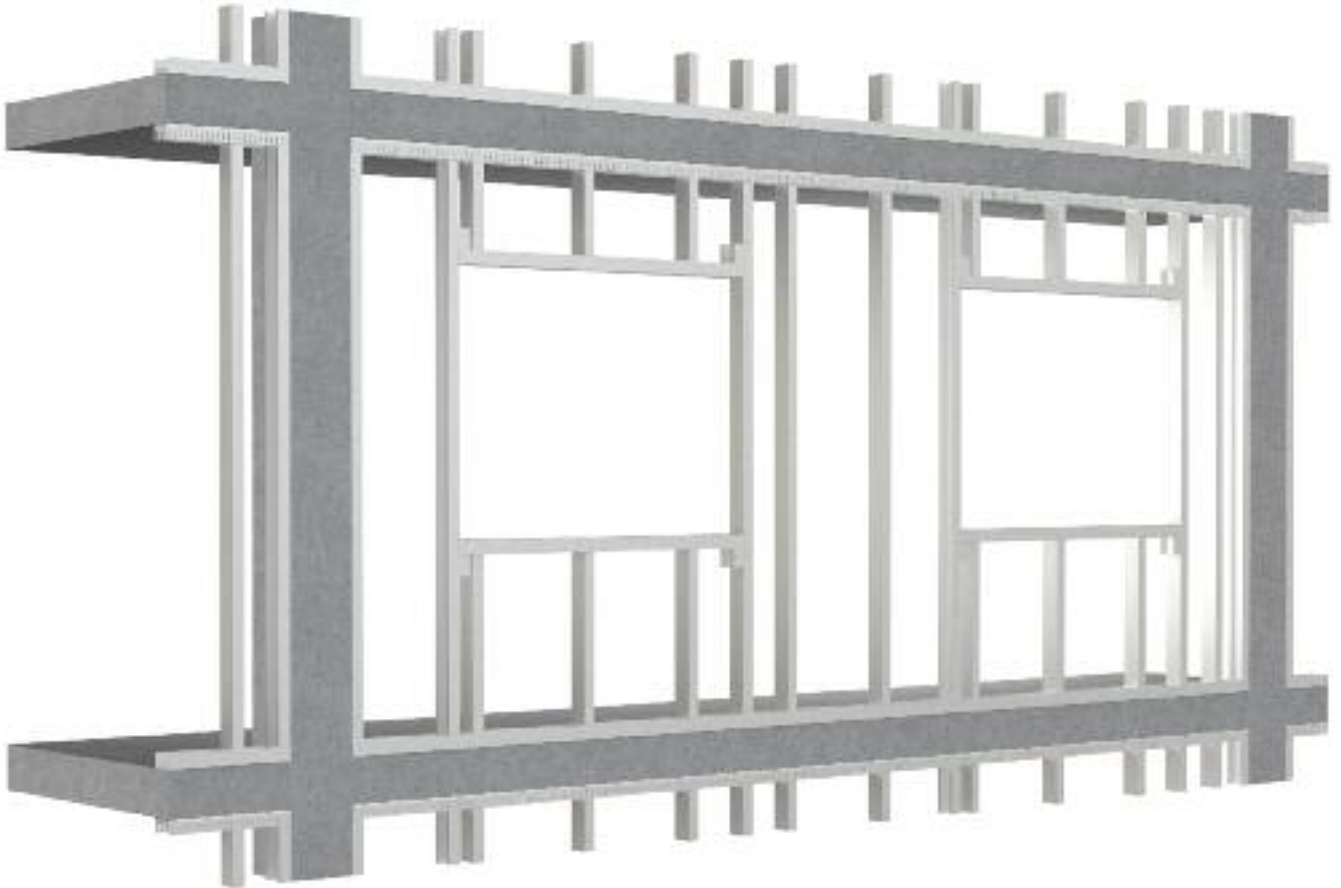
100M12 = Lipped C section of 100mm depth, 1.2mm material thickness.

104M12 = Non-lipped channel section of 104mm depth, 1.2mm material thickness.

'M' reference denotes SFS section.

# SFS - Infill walling

Metsec SFS forms a secondary structure which is fixed between the primary super structure. It is generally positioned at the slab edge allowing insulation and external finishes to be installed continuously outside the main structural frame.



The Post Box, Birmingham

## High load cleats

The high load deflection cleats are typically used for door and window jamb studs where the reaction at the head or base of the stud exceeds the capacity of the supporting track. These cleats can be provided plain, for the base, or slotted to allow for vertical deflection at the head.



**Cantilever Post**

Centres as Metsec design.

**Lintel track**

As Metsec design.

**Stud section as support bracket**

Minimum 150mm long stud section fixed through jamb web with 4 no. Tek screws.

**Additional stud**

150mm from jamb, where brick-tie channels required for masonry finish.

**Jamb stud**

As Metsec design.

**Cill track**

As Metsec design.

**Cill support bracket**

Design may require stud section to extend to base track.

**Metsec slotted head track**

Metsec's slotted head track has been developed to allow for the deflection in the primary structural frame. The studs are screw fixed to the slotted head track through pre-formed slots in the track.

Key advantages over alternative systems are:

- Quicker and easier to install than conventional deflection brackets.
- Simpler and faster to install than traditional masonry infill.
- Fewer components on site - less components to store, lose or work with.
- Fix and forget system - no concerns about missing brackets.
- Visible centre line indent indicates fixing location.
- Vertical slots at 25mm centres allow for flexibility of stud positions.

**Studs**

Section size and centres according to Metsec design. Top of stud is positioned 15mm short within track.

**Studs fixed to track**

With low profile Tek screws, both flanges.

**Base track**

Supported by and fixed to primary frame as Metsec design.



# SFS - Continuous walling

The Metsec SFS continuous external walling system is constructed outside the main structural frame.

This form of construction is ideal where movement joints in the external cladding need to be minimized.

The base of the system requires vertical support.

The base track is fixed to the support member.

Studs are then built multiple storeys tall as determined by design.

Studs are fixed to each slab edge using cleats with slots to allow for vertical movement in the primary structure.

Each lift of studs is capped with a track that provides support for the base track of the next lift of studs.

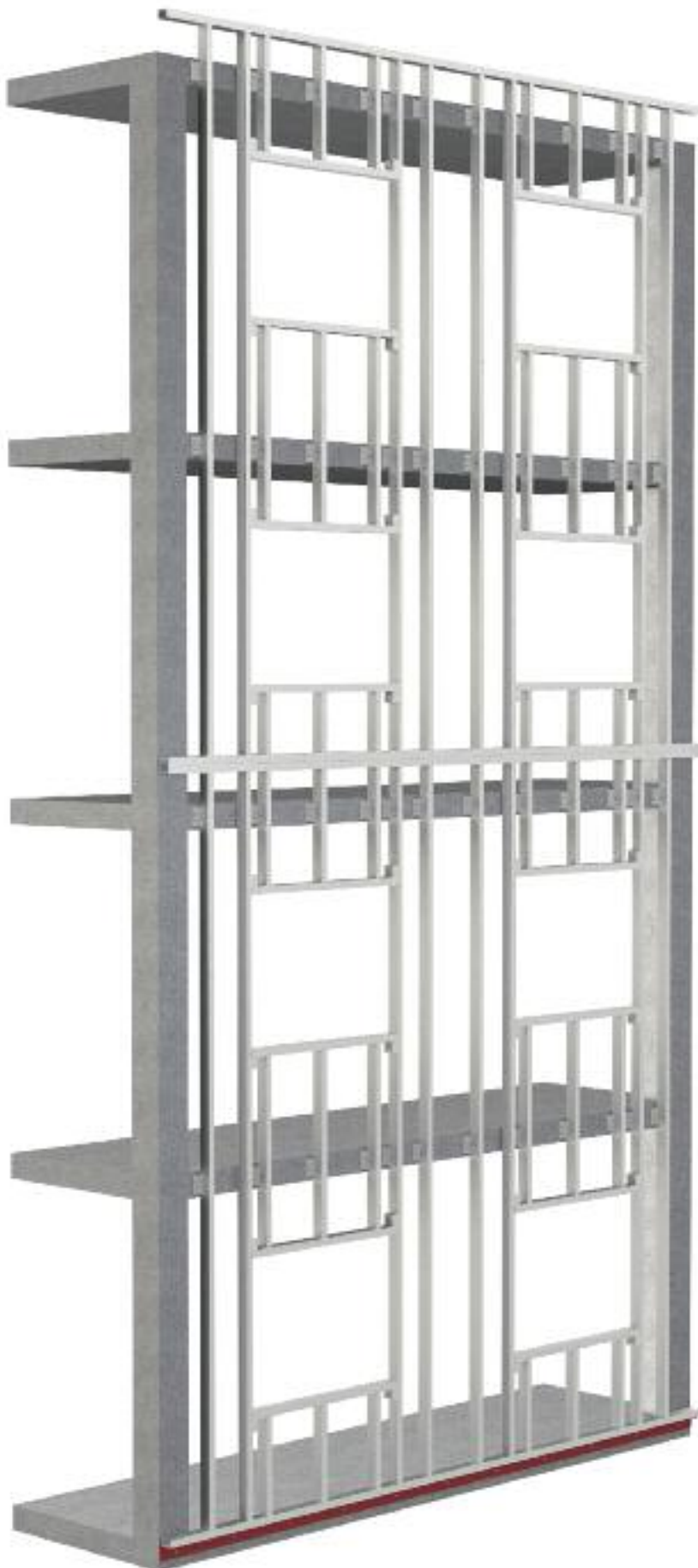
## Cleats



Cleats can be produced either 3mm or 6mm thick and 130mm or 190mm deep. Slots can be provided to allow the cleat to be used as a deflection cleat. Alternatively, the cleat can be manufactured plain (without slots) to act as a dead load cleat. The projecting cleat leg can vary from 100mm to 300mm in increments of 25mm.

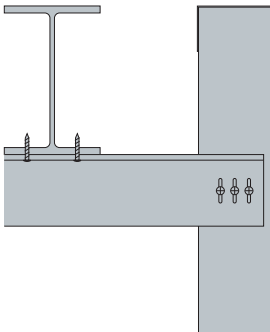
The return leg of the 3mm cleat can be provided without holes to allow the use of self tapping tek screws or shot fired nails into hot rolled steel. Alternatively, 9mm diameter holes can be provided to allow the cleat to be fixed to concrete with M8 Large Diameter Tapcons (LDTs).

The 6mm cleat will always be provided with 9mm holes to allow it to be fixed using either M8 LDTs to concrete, or M8 blind bolts to steel.



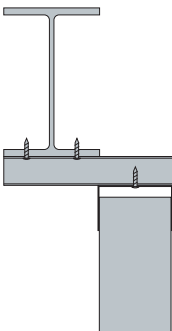
### Slotted angle (SA1002)

The use of slotted angles is often advantageous where the SFS is offset from the primary structure frame by a distance which is too great for cleats.



### Zed bars (Z402)

40 x 40 x 40 x 2mm zed bars can be provided in 2mm material and 600mm length. Zed bars are commonly used where there is not sufficient bearing at the head or base of the SFS panel.



Upper floor

Intermediate floor

Lowest floor

### Head track

Tek screwed to all studs

### Intermediate base/head track

Base and head track are fixed back to back to receive studs from above and below. (Typically 300mm above SSL.)

### Studs

Continuous past the slab. Stud height, gauge, centres and size according to Metsec bespoke design.

### Angle cleats

By design. Mechanical anchors to slab edge. Tek screws through slots in cleats to each stud.

### Window lintel track

### Window cill track

### Base track

Fixed to support member with Tek screws.

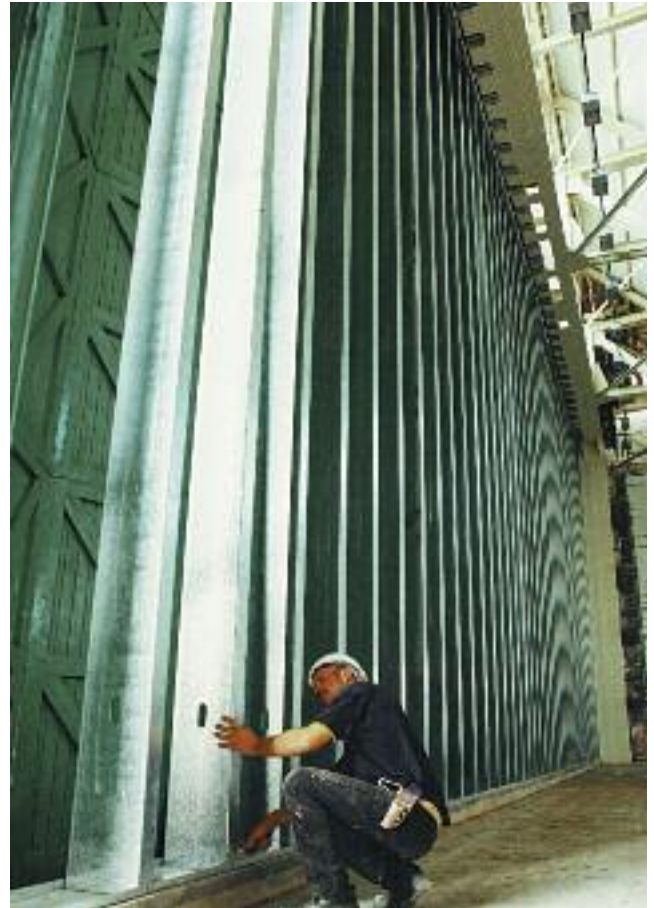
### Support member

Anchored to slab edge. Designed and supplied by others.

# SFS – High Bay separating walls

Metsec SFS High Bay Wall is a high performance single span separating wall.

Its lightweight construction and uniformly distributed loading normally eliminates the need to strengthen foundations or existing floors. This reduces the time required for installation and minimises the overall project cost.



Above and above right - David Lloyd Centre, Liverpool



**Hot rolled steel roof beam****Angle section restraint members**

Fitted to the underside of purlins each side of partition head.

**38VB09 Strap on both sides**

1 no. Tek screw to every stud flange,  
3 no. Tek screws to each blocking piece.

**Wall head blocking**

Stud section cut to fit snugly between studs, fitted every third bay and to end studs in partition.

**Full height studs**

Section size and centres as Metsec design.

Studs stopped short from top of angles to allow for vertical movement as required by design.

**Mid height blocking**

Stud section cut to fit snugly between studs and fitted every third bay and to end studs in partition.

**38VB09 Strap on both sides**

1 no. Tek screw to every stud flange,  
3 no. Tek screws to each blocking piece.

**Jambs and lintels**

Jambs and lintels by Metsec design. Compound members (such as above) may be required.

**Base track**

Studs fixed to base track with low profile tek screws both flanges.

# SFS - Load-bearing systems

Metsec can design and supply a complete load-bearing superstructure for low to medium rise structures.

Metsec components are supplied to site loose and are assembled in-situ with Tek screwed connections.

This system has many advantages over traditional methods of construction.

It is light-weight, fast track, durable and is suitable for confined sites.

Metsec's technical team can offer advice on wall and floor build-ups and have a library of test details to substantiate performance data for a range of build-ups.

A design and detailing service can be provided. For this process to work effectively, the following basic architectural information should be provided by the design team:

- Wall set-outs and build-ups.
- Structural set-out of apertures in walls.
- Floor build-up and positions where trimming-out required.
- Roof build-up and set-out and details of feature (ie. eaves/parapets/hatches etc)
- Junction detail with supporting elements.

## Please note

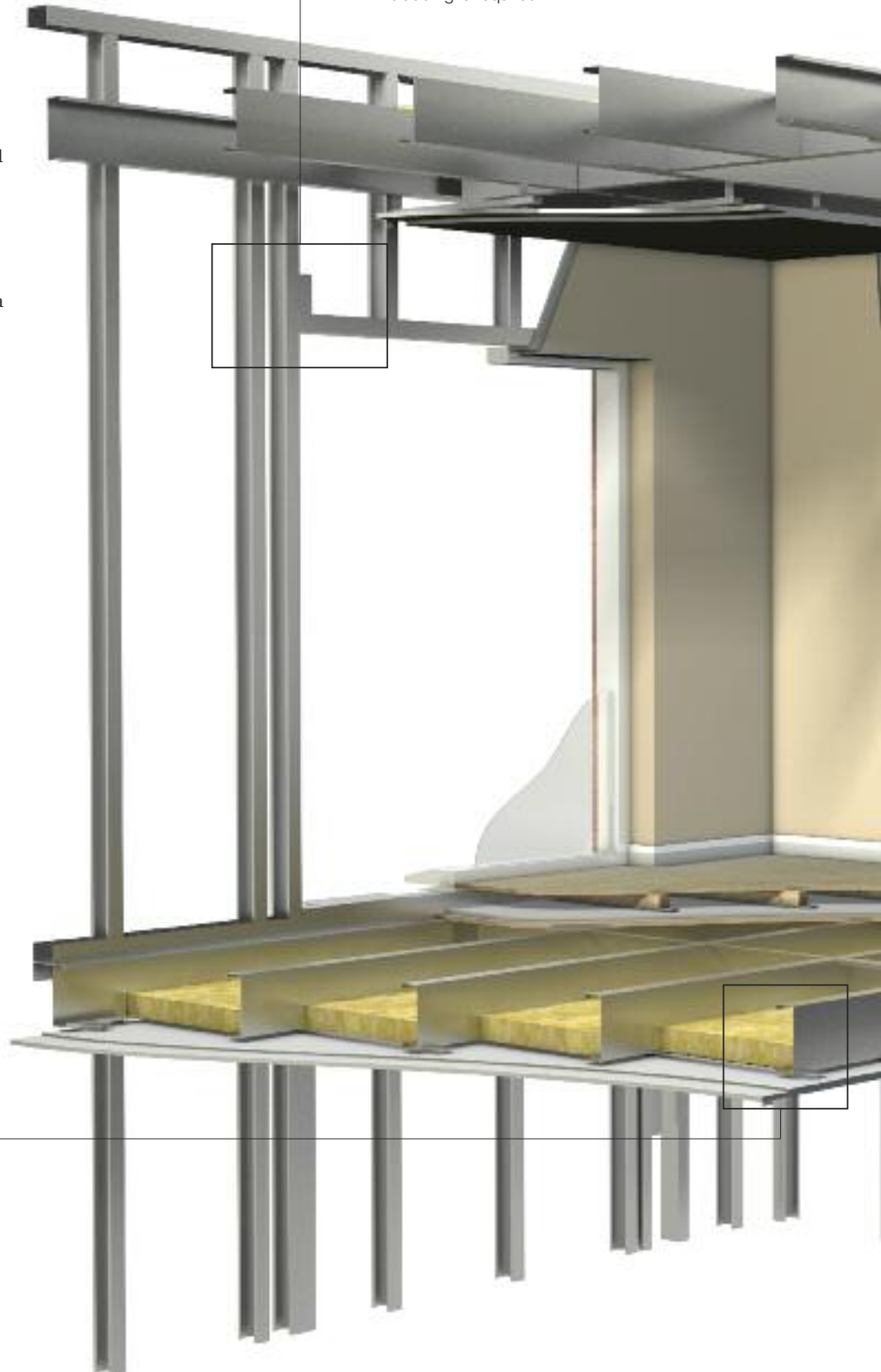
Load-bearing structures require a full Metsec design prior to commencement of work on site.

## Apertures

Set to suit architectural layout.

Lintel and jamb design is dependent on aperture configuration. A short section of stud is used as a support bracket for lintels and cills.

An additional stud is positioned adjacent to the jamb for a brick-tie channel where masonry cladding is required.



## Ceiling

Resilient bars fixed to underside of Metsec joists.

**Walls**

Metsec lipped C-section studs storey height with track sections at base and head.  
Set-out/extent of SFS wall to suit architectural configuration and Metsec design requirements.  
Size/gauge and centres of studs as design.

**Bracing**

Flat strap bracing screw fixed to wall studs. Quantities and positions as Metsec design.

**Roofs**

Joists laid flat or with a fall to suit project.  
Access hatches/roof-lights can be incorporated where required.  
Bracing requirements are dependent upon roof build-up.  
Parapet detail shown has studs continuous from floor below.  
Joists supported by and fixed to end track which is fixed to studs.  
End joists are also screwed to studs.

**External finishes**

SFS Load-bearing walls can provide support/restraint for most finishes (see pages 18-23)  
Foil-faced rigid insulation for masonry cladding shown.

**Floors**

Metsec joists depth, gauge and centres to suit spans required.  
Joists supported by/fixed to track, screwed to wall head.

**Blocking detail**

Solid blocking of joist section cut to fit snugly between every third joist and adjacent first/last joist.  
Design to determine requirements.

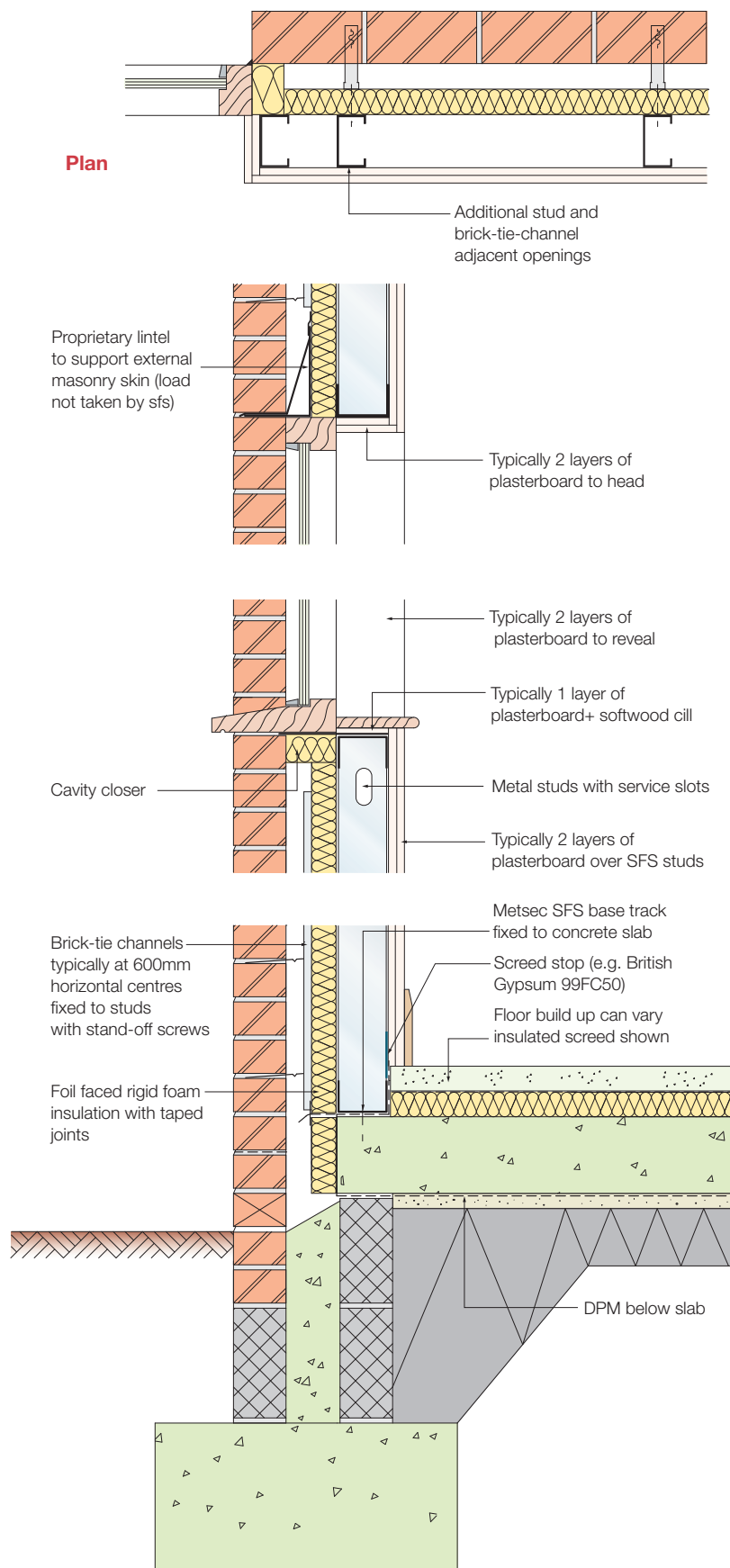
**Floating floor**

Shown over Metsec

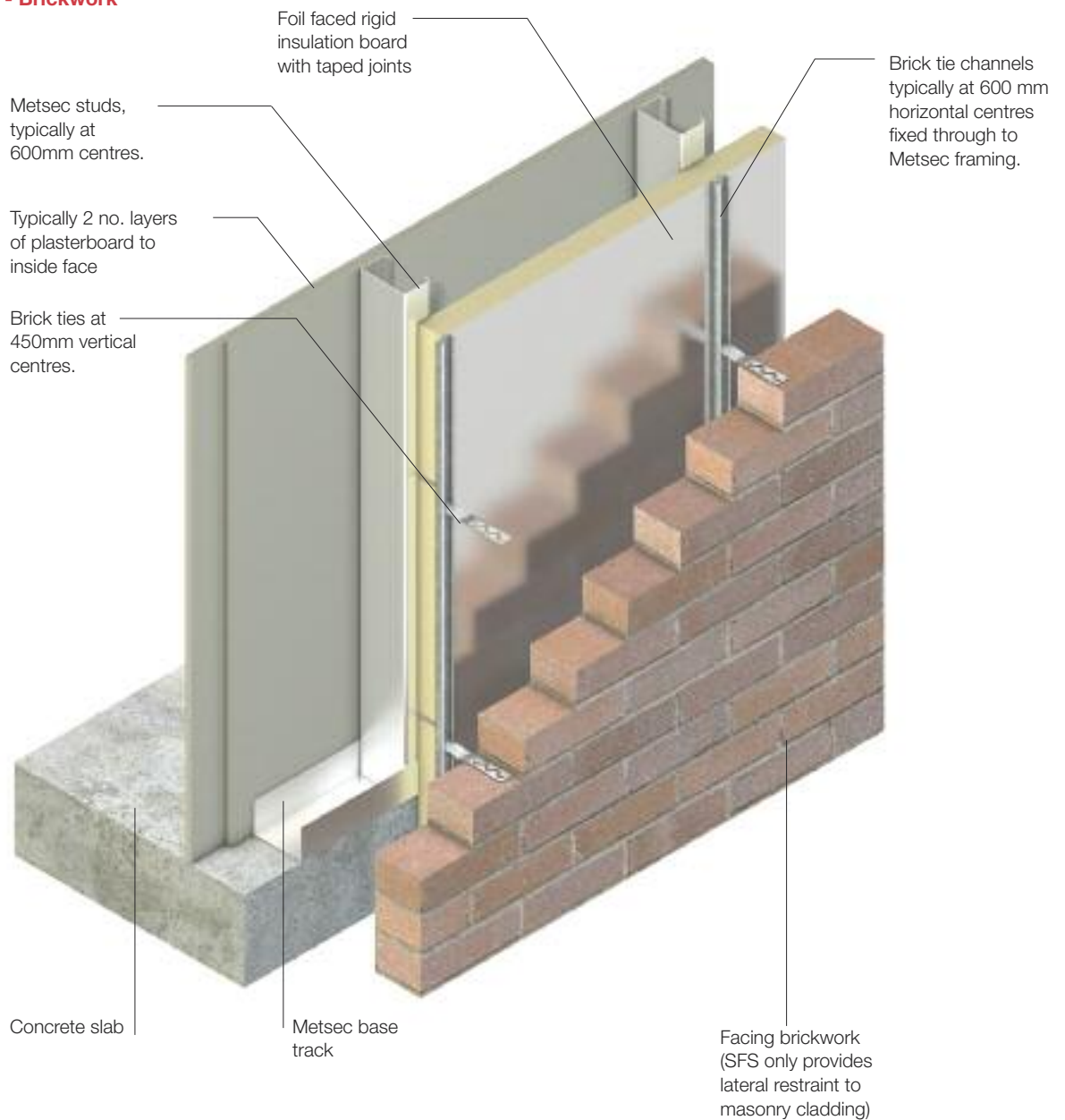


# Typical cross section - masonry clad

Metsec SFS can provide support/restraint for most cladding materials and external veneers. This gives the Project Architect total flexibility to create the desired building form.



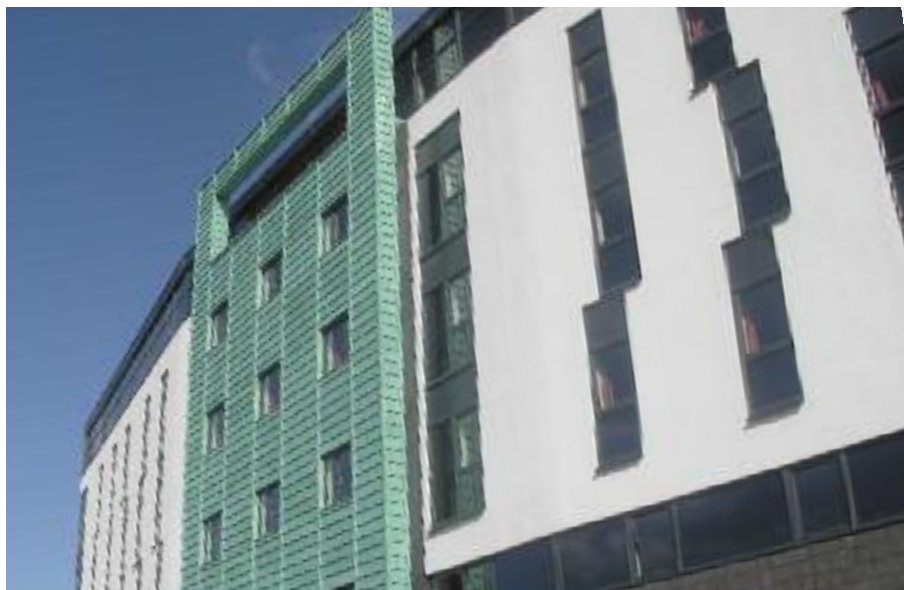
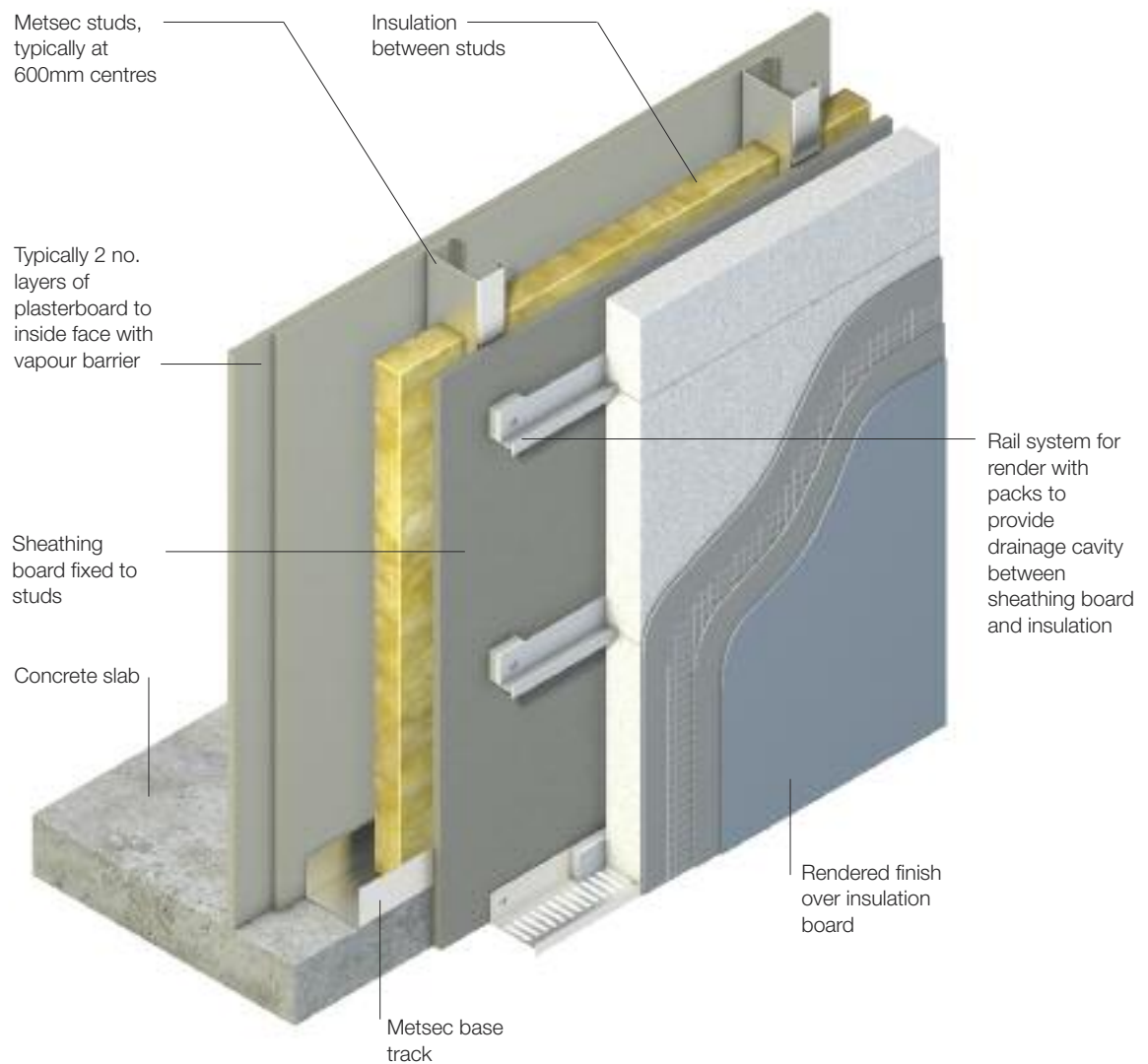
**Typical cross section - Brickwork clad**

**External wall - Brickwork**

Woolwich Arsenal, London

# External finishes

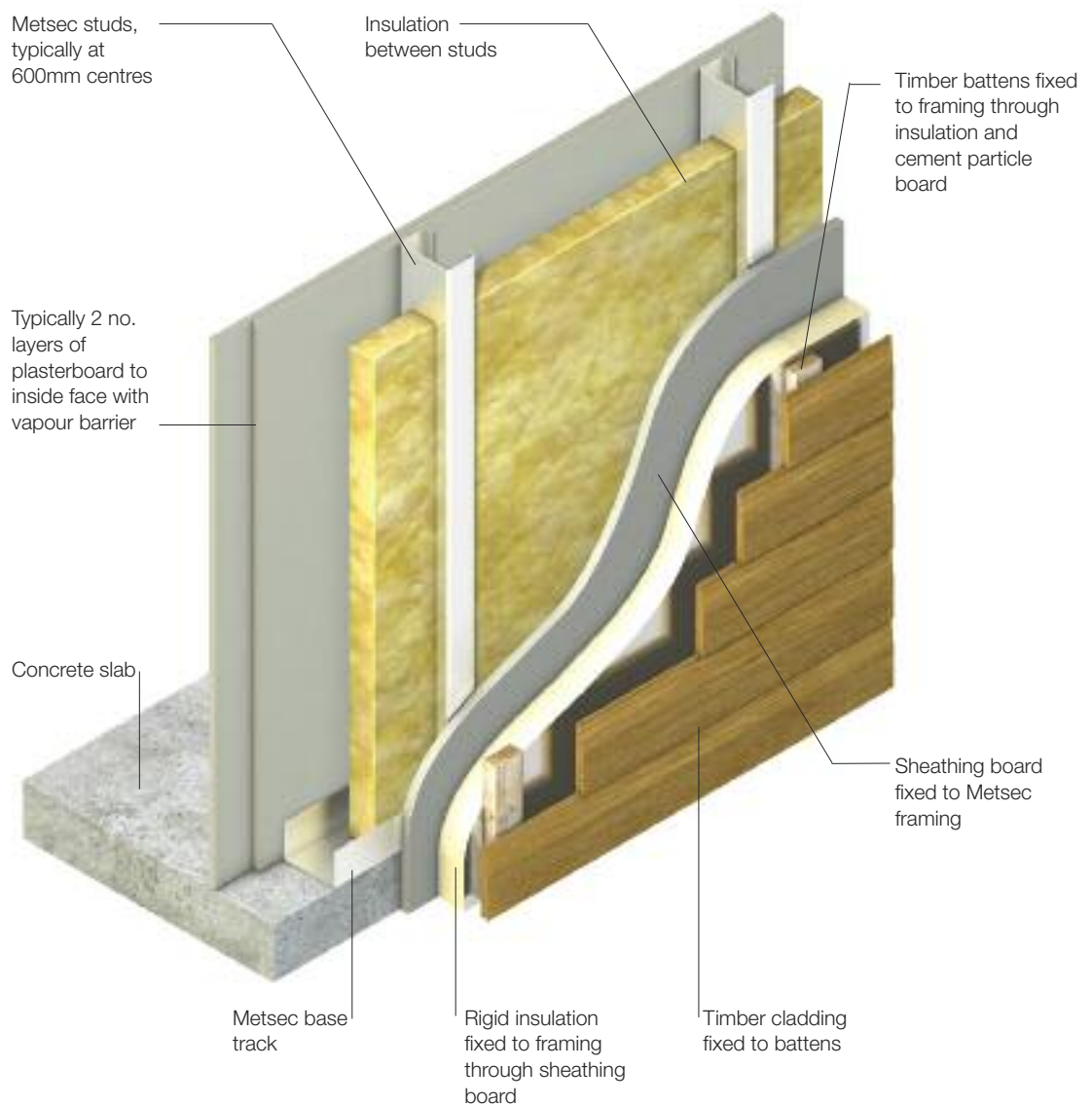
## External wall - Insulated render



Chettles Yard, Nottingham

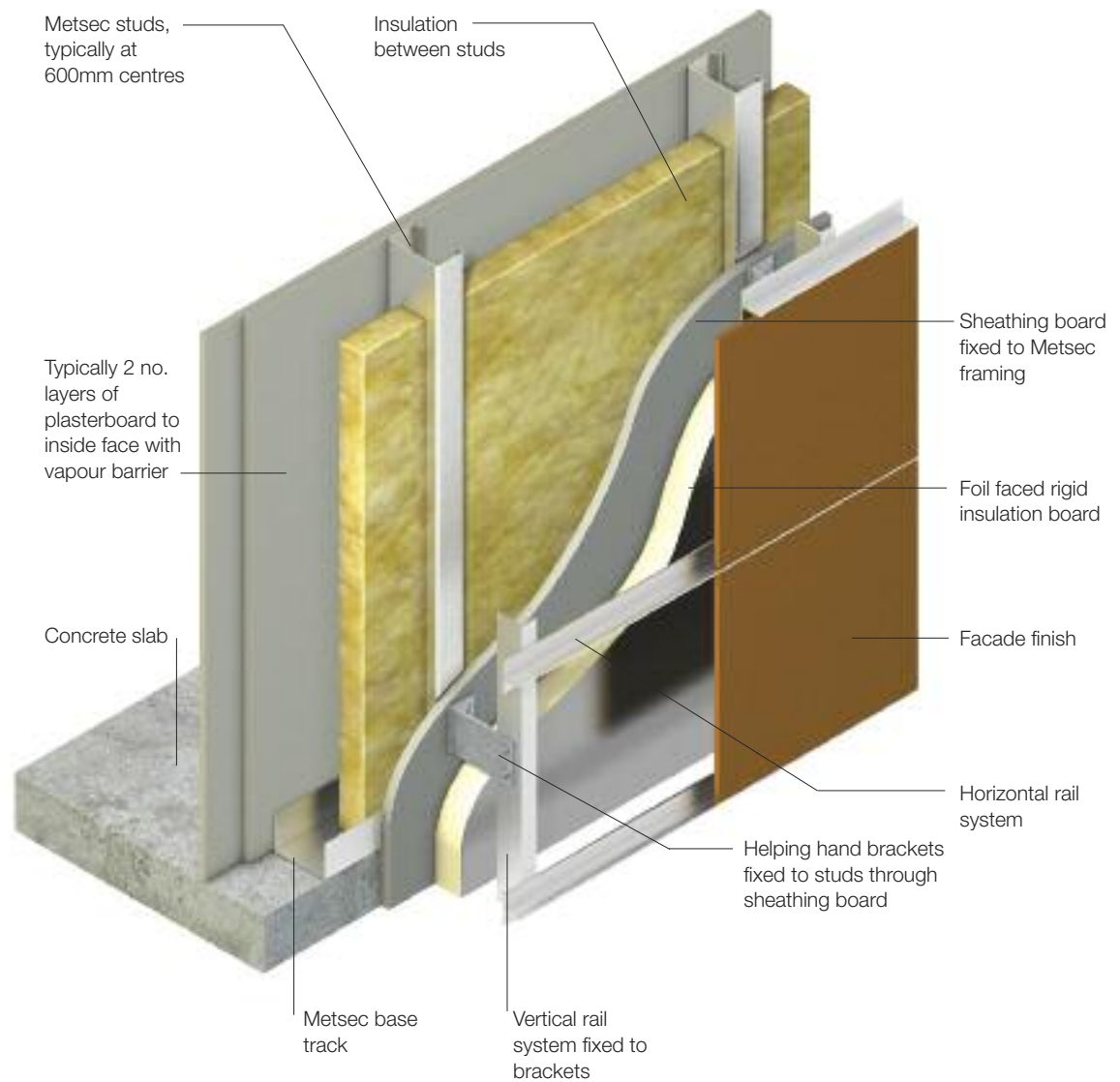


### External wall - Timber cladding



Stratford train crew accommodation, London

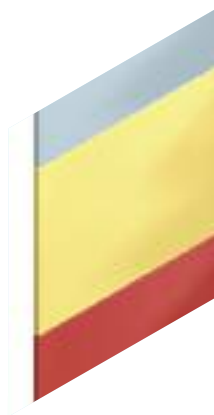
## External wall - Ventilated rainscreen



Many facade finishes are available to use on rainscreen systems including:



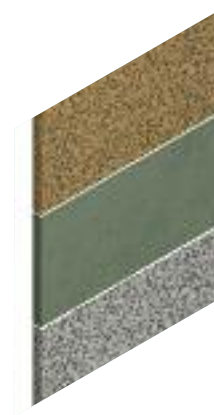
Metal cladding



High Pressure Resins



Terracotta tiles

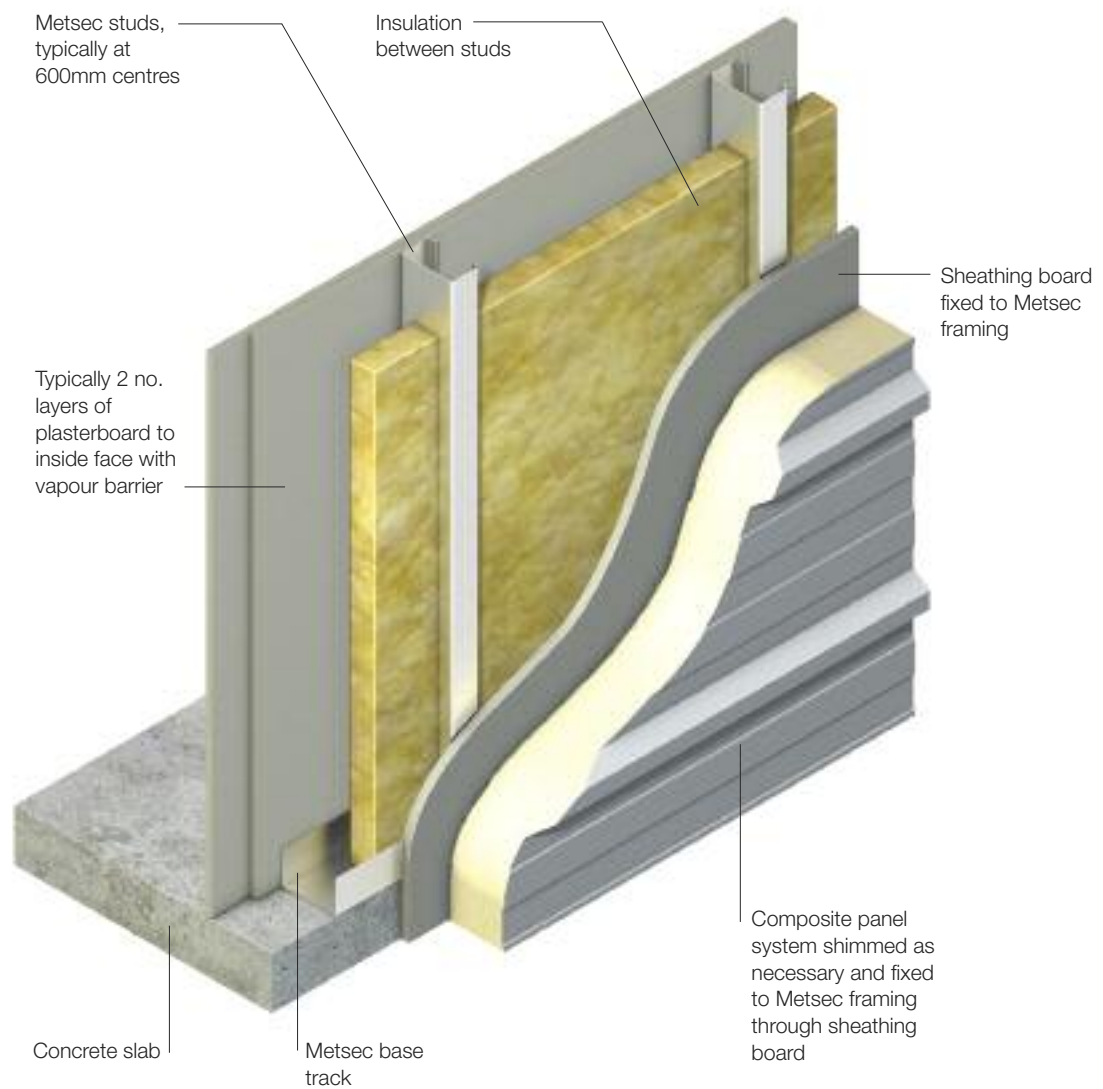


Stone tiles



Fibre Cement Panels

Carrier systems and brackets may vary, depending on manufacturers' requirements.

**External wall - Composite panels**

Canterbury College



# Sector applications - Health



Nuffield Hospital, Leeds



New Victoria Hospital, Glasgow



# Education



The Bridge Academy, Hackney - image courtesy of BDP



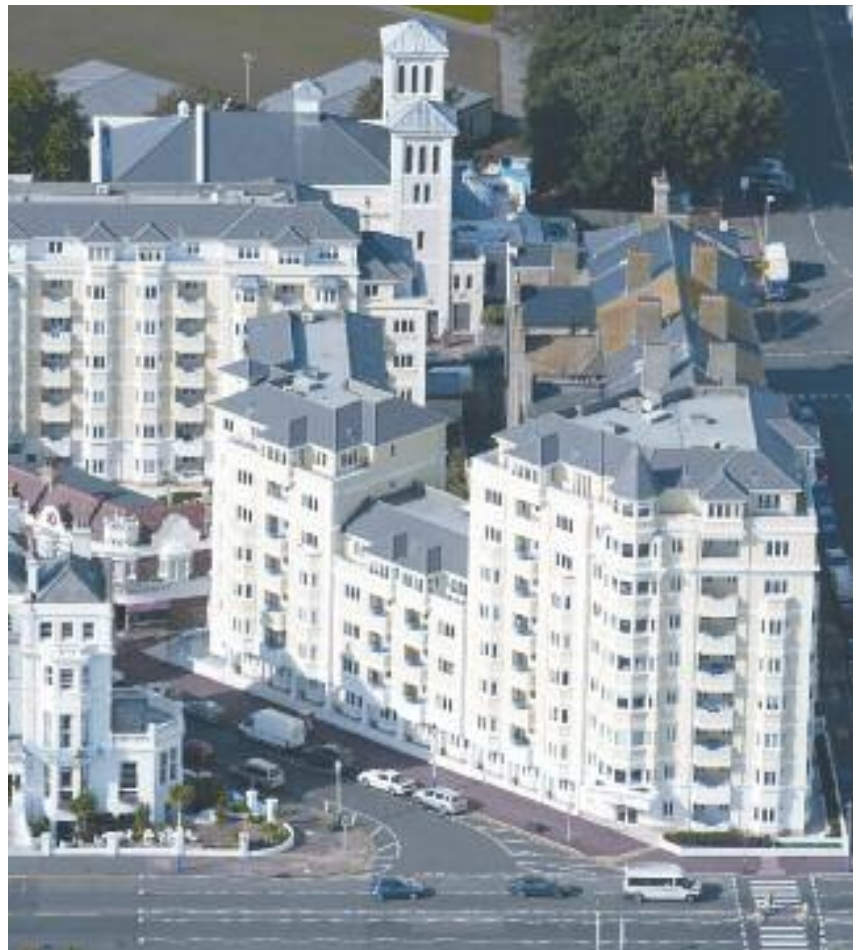
Old School Hall, Wellington, Telford



# Sector applications - Residential



Opal Court, Birmingham



Devonshire Baths, Eastbourne

# Leisure



MyHotel, Brighton

# Commercial



BDP Offices, Manchester



BDP Offices, Manchester



# Performance data

## Fire resistance

The fire resistances given in the performance tables apply to imperforate constructions tested to BS 476: Part 22: 1987, or assessments based on these tests.

## Thermal efficiency

The U-values quoted in the external wall data, pages 30-31 have been obtained by the combined method, which takes account of the performance of the individual elements making up the wall construction.

## Sound insulation

The  $R_w$  ratings given in the performance tables apply to imperforate constructions laboratory tested in accordance with BS EN ISO 140-3: 1995 and rated in accordance with BS EN 717: 1997, or assessments based on these tests. The  $C_{tr}$  adaption term is a requirement of the Building Regulations, Approved Document E. The  $R_w + C_{tr}$  measurements emphasise the low frequency performance of separating elements and assist the building designer in specifying the best solution. It must be stressed however, that the regulations generally require performance to be proven by site tests and to achieve this full account must be taken of flanking sound transmission and junction detailing.



British Gypsum works closely with Metsec in a continuous programme to develop drywall construction methods to satisfy all of the latest statutory fire, thermal and acoustic requirements. Independent test data is available to substantiate these solutions. British Gypsum is a major authority in the UK construction industry and the country's leading manufacturer and supplier of gypsum-based plastering and drylining solutions. With a long history of providing innovative, cost-effective and reliable products that meet the demands of the construction industry, the company is renowned for its pioneering work in training, as well as its forward-thinking strategy on innovation and product development.

Using over a century of expertise British Gypsum has developed the UK's leading range of wall, wall lining, floor, ceiling and encasement systems, for the residential, commercial and RMI (refurbishment, maintenance and improvement) sectors of the construction industry.

Visit our website at:

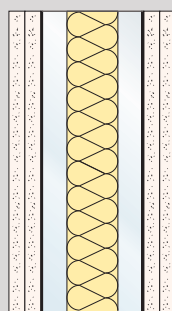
[www.british-gypsum.com](http://www.british-gypsum.com)

Telephone: 0844 800 1991 Fax: 0844 561 8816

E-mail: [bgtechnical.enquiries@bpb.com](mailto:bgtechnical.enquiries@bpb.com)

## Internal walls

15mm board (see below)  
15mm board (see below)  
SFS studs and insulation  
15mm board (see below)  
15mm board (see below)



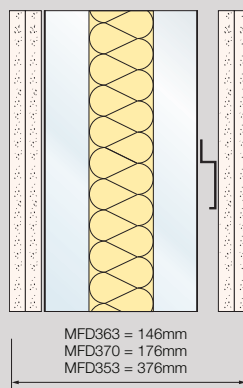
MFD359 = 130mm  
MFD371 = 160mm

| Metsec ref:   | Stud and Insulation  | Board                              | Performance values                                       |
|---------------|--|------------------------------------|--|
| <b>MFD359</b> | 70mm deep studs @ 600mm centres with 25mm Acoustic Partition Roll (1200) | 2x 15mm Gyproc WallBoard Each face | Fire = 60 Mins<br>Acoustic: $R_w + C_{tr} = 39\text{dB}$ |
|               | 70mm deep studs @ 600mm centres with 25mm Acoustic Partition Roll (1200) | 2x 15mm Gyproc FireLine Each face  | Fire = 120 Mins  |
| <b>MFD371</b> | 100mm deep studs @ 600mm centres with 50mm multi purpose slab            | 2x 15mm Gyproc WallBoard Each face | Fire = 60 Mins<br>Acoustic: $R_w + C_{tr} = 40\text{dB}$ |
|               | 100mm deep studs @ 600mm centres with 50mm multi purpose slab            | 2x 15mm Gyproc FireLine Each face  | Fire = 120 Mins  |



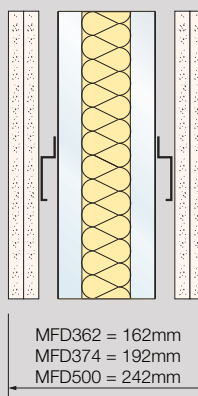
## Internal walls

15mm board (see below)  
 15mm board (see below)  
 SFS studs and insulation  
 Gyproc Resilient Bar RB1  
 15mm board (see below)  
 15mm board (see below)



| Metsec ref:   | Stud and Insulation  | Board                                 | Performance values                                       |
|---------------|--|---------------------------------------|--|
| <b>MFD363</b> | 70mm deep studs @ 600mm centres with 25mm Acoustic Partition Roll (1200) | 2x 15mm Gyproc WallBoard<br>Each face | Fire = 60 Mins<br>Acoustic: $R_w + C_{tr} = 49\text{dB}$ |
|               | 70mm deep studs @ 600mm centres with 25mm Acoustic Partition Roll (1200) | 2x 15mm Gyproc FireLine<br>Each face  | Fire = 120 Mins  |
| <b>MFD370</b> | 100mm deep studs @ 600mm centres with 50mm multi purpose slab            | 2x 15mm Gyproc WallBoard<br>Each face | Fire = 60 Mins<br>Acoustic: $R_w + C_{tr} = 50\text{dB}$ |
|               | 100mm deep studs @ 600mm centres with 50mm multi purpose slab            | 2x 15mm Gyproc FireLine<br>Each face  | Fire = 120 Mins  |
| <b>MFD353</b> | 300mm deep studs @ 600mm centres with 100mm general purpose slab         | 2x 15mm Gyproc SoundBloc<br>Each face | Fire = 60 Mins<br>Acoustic: $R_w + C_{tr} = 56\text{dB}$ |

15mm board (see below)  
 15mm board (see below)  
 16mm Gyproc Resilient Bar RB1  
 SFS studs and insulation  
 16mm Gyproc Resilient Bar RB1  
 15mm board (see below)  
 15mm board (see below)



| Metsec ref:   | Stud and Insulation  | Board                                 | Performance values                                       |
|---------------|--|---------------------------------------|--|
| <b>MFD362</b> | 70mm deep studs @ 600mm centres with 25mm Acoustic Partition Roll (1200) | 2x 15mm Gyproc WallBoard<br>Each face | Fire = 60 Mins<br>Acoustic: $R_w + C_{tr} = 51\text{dB}$ |
|               | 70mm deep studs @ 600mm centres with 25mm Acoustic Partition Roll (1200) | 2x 15mm Gyproc FireLine<br>Each face  | Fire = 120 Mins  |
| <b>MFD374</b> | 100mm deep studs @ 600mm centres with 50mm multi purpose slab            | 2x 15mm Gyproc WallBoard<br>Each face | Fire = 60 Mins<br>Acoustic: $R_w + C_{tr} = 54\text{dB}$ |
|               | 100mm deep studs @ 600mm centres with 50mm multi purpose slab            | 2x 15mm Gyproc FireLine<br>Each face  | Fire = 120 Mins  |
| <b>MFD500</b> | 150mm deep studs @ 600mm centres with 75mm Isover high performance slab  | 2x 15mm Gyproc SoundBloc<br>Each face | Fire = 60 Mins<br>Acoustic: $R_w + C_{tr} = 60\text{dB}$ |

## Notes:

1. Sound insulation values are for airtight constructions in the absence of flanking sound transmission.
2. For full information of British Gypsum dry-lining and insulation products included in these tables see the British Gypsum White Book and current literature ([www.british-gypsum.com](http://www.british-gypsum.com))
3. Performance data relates to load-bearing construction. For details of non load-bearing construction refer to British Gypsum.

**External wall: MFD395** (Sto calculations)

142

External Wall: MFD395

Diagram illustrating a grid layout with a total width of 142. The grid is divided into four vertical sections:

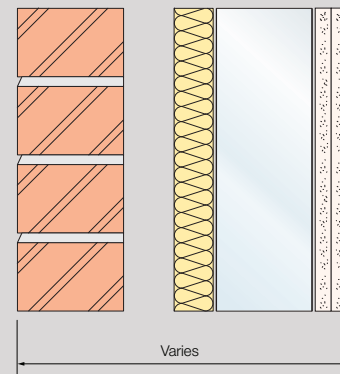
- Section 1 (Left): White background, blue border.
- Section 2: Yellow background, blue border.
- Section 3: Blue background, yellow border.
- Section 4 (Right): Yellow background, blue border.

The total width of the grid is 142.

## External walls with brickwork

### External Wall: MFD380 - calculation combined method

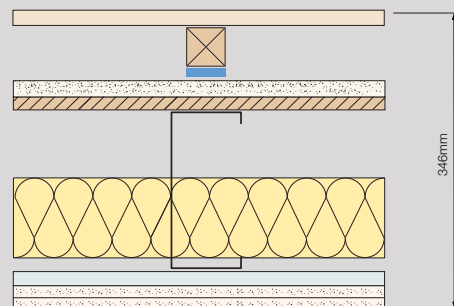
|                |   |
|----------------|---|
| Construction:  | 103mm Brickwork   |
|                | 50mm cavity   |
|                | Kingspan insulation (see below)   |
|                | 100mm Stud @600 centres   |
|                | 15mm board (see below)  |
|                | 15mm board (see below)  |
| Fire (inside): | 60 minutes - Use 2x15mm Gyproc WallBoard  |
|                | 120 minutes - Use 2x15mm Gyproc FireLine Board                                  |
| Acoustic:      | N/A   |
| Thermal:       | 40mm Thermawall TW55 (stainless steel fixings to brick-tie-channels) 0.29 W/m²K |
|                | 50mm Thermawall TW55 (stainless steel fixings to brick-tie-channels) 0.26 W/m²K |
|                | 75mm Thermawall TW55 (stainless steel fixings to brick-tie-channels) 0.20 W/m²K |



## Joisted floors

### Floor: MFD384

|               |  |
|---------------|--|
| Construction: | 18mm V313 chipboard                    |
|               | 53mm Danskin acoustic battens          |
|               | 19mm Gyproc plank                      |
|               | 15mm Ply                               |
|               | 200mm Metsec joists @ 600 centres      |
|               | 75mm Multi purpose slab between joists |
|               | 16mm Gyproc resilient bar RB1          |
|               | 12.5mm FireLine Board                  |
|               | 12.5mm FireLine Board                  |
| Fire:         | 60 Minutes                             |
| Acoustic:     | $R_w + C_{tr} = 52$ dB                 |
|               | $L_{n,w} (Ci) = 51$ (2) dB             |



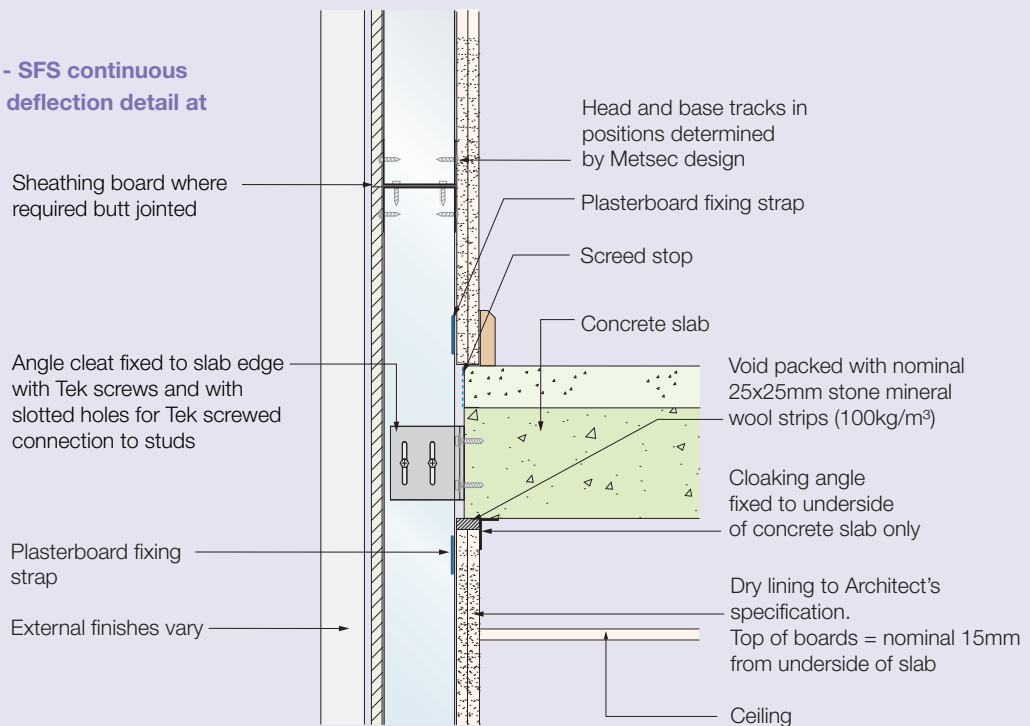
#### Notes:

1. Thermal performance values assume normal exposure conditions.
2. For full information of British Gypsum products included in these tables see the British Gypsum White Book and current literature ([www.british-gypsum.com](http://www.british-gypsum.com)).
3. Performance data applies to load-bearing construction. For details of non load-bearing internal construction refer to British Gypsum.
4. These details are to be read in conjunction with product data from the manufacturer of each proprietary finish.
5. Thermal values are typical for the constructions shown but could vary depending on the exact components used to form the cladding

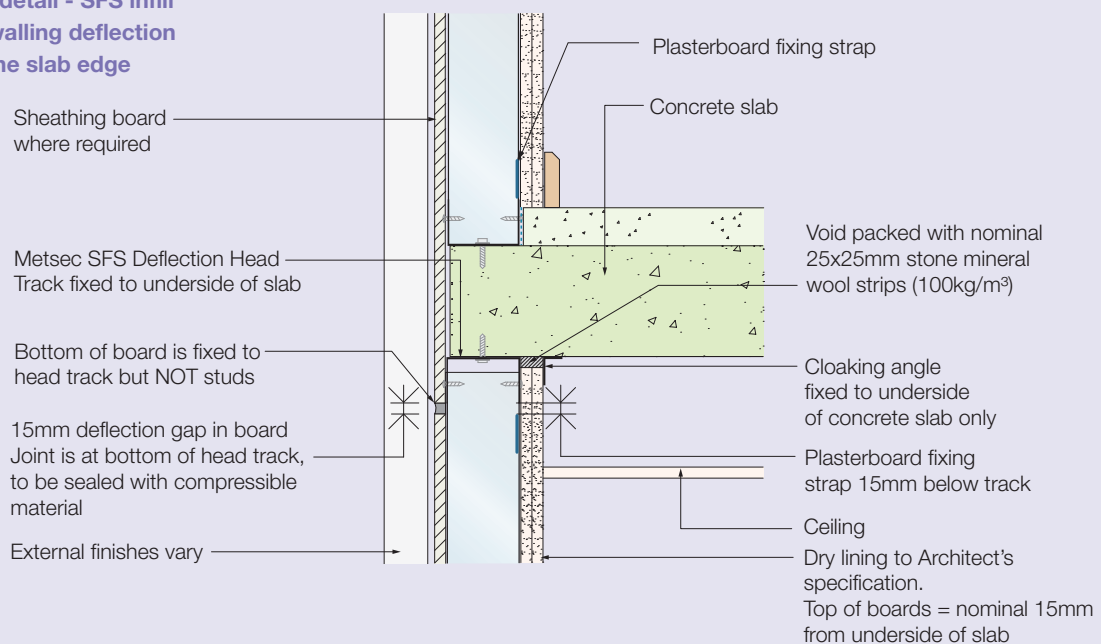
# Deflection head and junction details

Metsec components can be used in conjunction with standard dry lining details. Some typical junction details are shown below.

## Sectional detail - SFS continuous external walling deflection detail at the slab edge

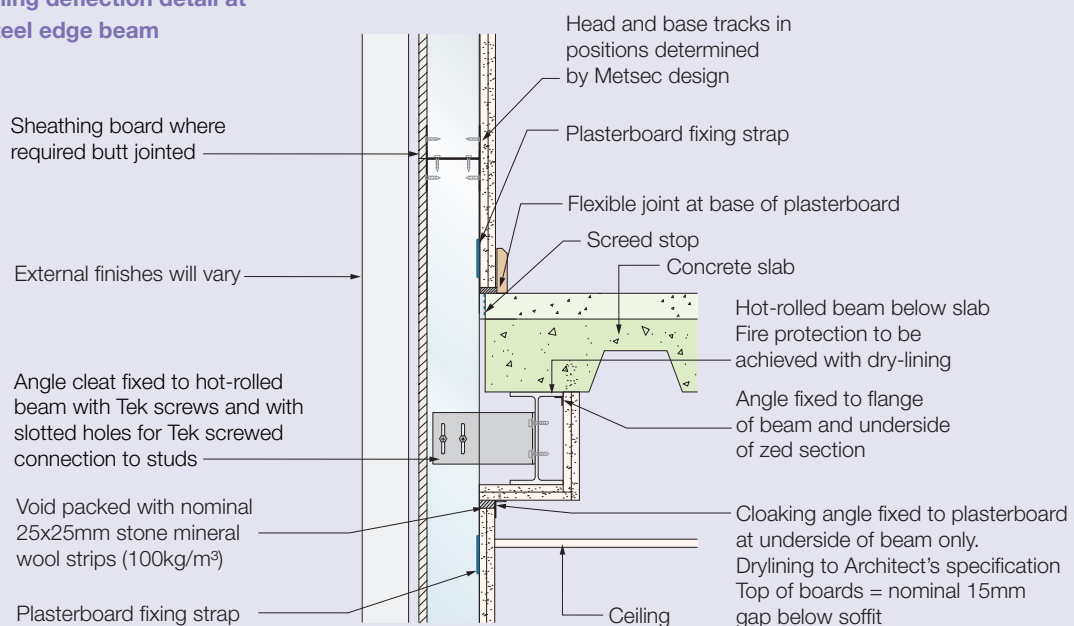


## Sectional detail - SFS infill external walling deflection detail at the slab edge

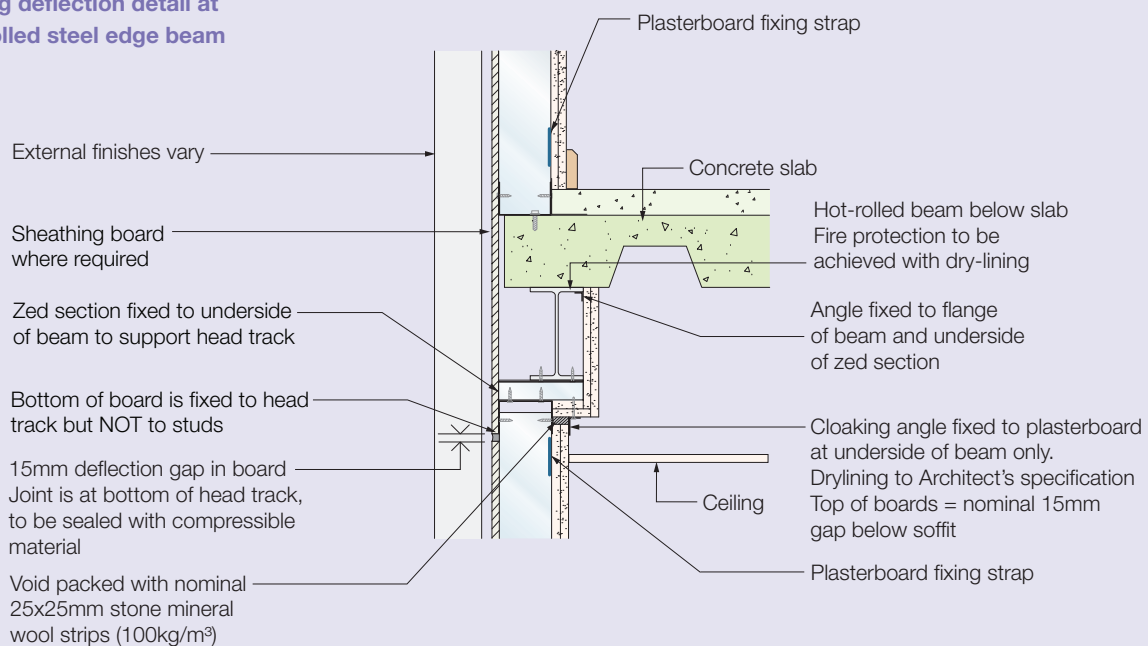




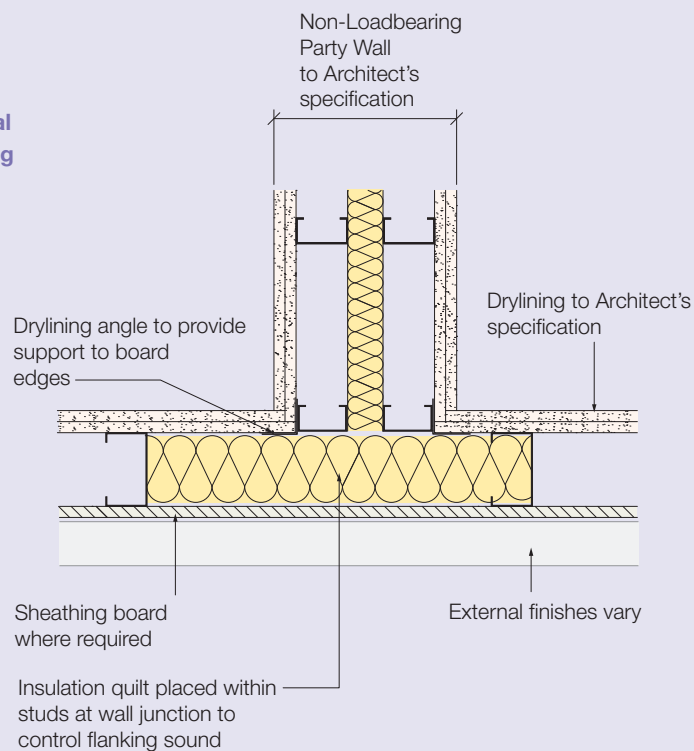
**Sectional detail - SFS continuous external walling deflection detail at hot-rolled steel edge beam**



**Sectional detail - SFS Infill walling deflection detail at hot-rolled steel edge beam**

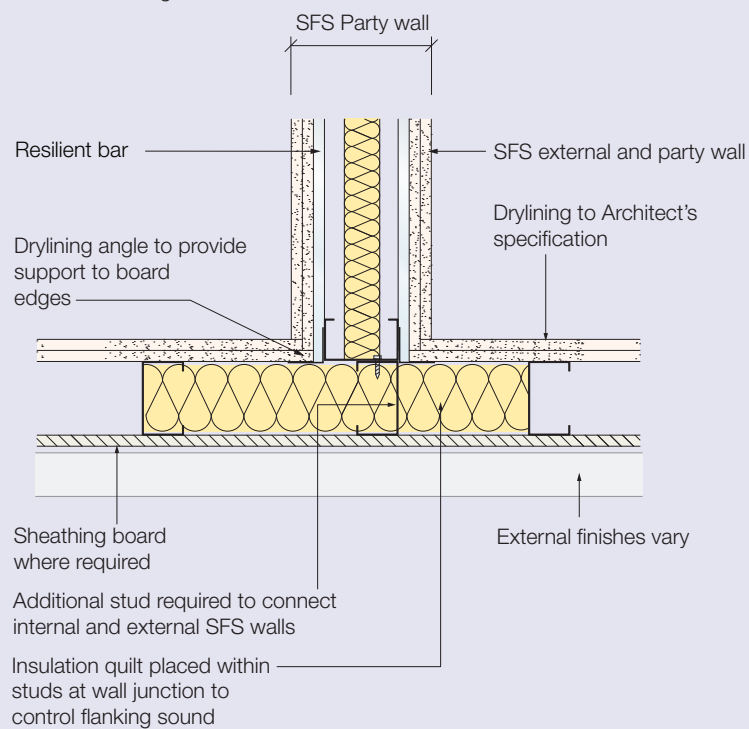


**Plan detail - Junction of load-bearing SFS external wall and non-load-bearing party wall**








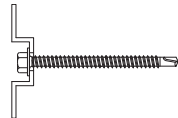









**Plan detail - Junction of load-bearing SFS external wall and party wall**

(Single skin party wall shown. Similar detail applies for twin skin)



# SFS fixing table

The table below lists approved fixings that can be used with Metsec SFS Framing. These details should be read in conjunction with the fixing manufacturer's literature. When Metsec project specific details specify fixings these take precedent over the general fixings noted below.

|  | Application   | Description  | Illustrations   | Hilti Product Code<br>Tel: 0800 886100                        | Spit Product Code<br>Tel: 0141 342 1660 | Ejot Product Code<br>Tel: 01977 687040 |
|--|---|--|---|---|---|--|
| General framing screw fixing<br>studs/joist/tracks and bracing | 1.2 - 1.5mm steel<br>to 1.2 - 1.5mm steel                                 | 5.5mm Diameter<br>Pan Head Screw                                       |    | S-MD01ZW 5.5x19   | CFC26                                   | JT2-NH3-5.5x19                         |
|  | 1.5 - 3.0mm steel<br>to 1.5 - 3.0mm steel                                 | 5.5mm Diameter<br>Low Profile Head Screw                               |    | S-MD03ZW 5.5x25   | CFC26                                   | LSCF 5.5x25                            |
|  | 1.2 - 3.0mm steel<br>to 3.0 - 12.5mm steel                                | 5.5mm Diameter<br>Hex Head Screw                                       |    | S-MD05Z 5.5x40  | TL38                                    | HS 5.5x38                              |
|  | 3.0mm max steel<br>to 6.0 - 12.5mm steel                                  | Powder Actuated Nail<br>To Hot Rolled Steel                            |    | X-U 16 P8 or<br>X-U 16 MX <sup>(2,3)</sup>                    | SC9 or SBR9 <sup>(3)</sup>              | None available                         |
| Steel to<br>concrete   | 1.2 - 3.0mm steel<br>to concrete  | Concrete Screw Anchor<br>Hex Head                                      |    | HUS-H 7.5x35 <sup>(4)</sup>                                   | 4H32 <sup>(4)</sup>                     | 4H 6.3x32 <sup>(4)</sup>               |
| Insulation to<br>steel   | 50mm <sup>(1)</sup> Insulation<br>to 1.2-3.0mm Steel                      | Large washer with inset<br>Stainless Hex Head Screw                    |    | S-MD03S 5.5x80  | TC75                                    | JT3-3-5.5x70                           |
|  | Fixing 50mm <sup>(1)</sup> Insulation<br>to 3.0-6.0mm Steel               | Large washer with inset<br>Stainless Hex Head Screw                    |   | All three manufacturers' products require Ejot SBV 90 Washers |   |  |
|  |   |  |   | S-MD05S 5.5x82  | None available                          | JT3-6-5.5x70                           |
|  |   |  |   | All three manufacturers' products require Ejot SBV 90 Washers |   |  |
| Brick tie<br>channels  | Fixed through<br>50mm <sup>(1)</sup> Insulation<br>to 1.2 - 3.0mm Steel   | 5.5mm Diameter Stainless<br>Hex Head Screw with<br>EPDM sealing washer |    | S-CD63S 5.5x85  | SCOTS Fixing                            | JT3-D-3-5.5x82<br>S16                  |
| Sheathing board and<br>timber to steel                         | Board thickness<br>6.0 - 19mm<br>to 1.2-3.0mm Steel                       | 4.8mm Diameter<br>Wafer/CSK Ribbed Head<br>Wing Tipped Screw           |   | S-WD12Z 4.8x38  | TFC36 or<br>RKC 41                      | WDLS 4.8x38                            |
|  | Board thickness<br>13 - 29mm<br>to 1.2-3.0mm Steel                        | 5.5mm Diameter<br>Wafer/CSK Ribbed Head<br>Wing Tipped Screw           |  | S-WD12Z 5.5x50  | TFC50 or<br>RKC 41                      | WDLS 5.5x50                            |
|  | Board thickness<br>25 - 60mm<br>to 1.2-3.0mm Steel                        | 5.5mm Diameter<br>Wafer/CSK Ribbed Head<br>Wing Tipped Screw           |  | S-WD12Z 5.5x85  | TFC80                                   | WDLS 5.5x85                            |
|  | Board thickness<br>10.0 - 24mm<br>to 3.0-6.0mm Steel                      | 5.5mm Diameter<br>Wafer/CSK Ribbed Head<br>Wing Tipped Screw           |  | S-WD15Z 5.5x65  | TFL65                                   | WDHS 5.5x65                            |
| Plasterboard to steel  | Single board up to 15mm<br>thick to 1.2-2.0mm Steel                       | 3.5mm Diameter<br>Bugle/Wafer/CSK Ribbed<br>Head Screw                 |  | S-DD01B 3.5x25  | TFC36 or<br>RKC 41                      | WDLS 4.8x38                            |
|  | Double boards up to<br>30mm combined<br>thickness to<br>1.2-2.0mm steel   | 3.5mm Diameter<br>Bugle/Wafer/CSK Ribbed<br>Head Screw                 |  | S-DD01B 3.5x45  | TFC80                                   | WDLS 5.5x85                            |
|  | Single board up to 15mm<br>thick to 2.0 - 6.0mm steel                     | 4.8mm Diameter<br>Wafer/CSK Ribbed Head<br>Wing Tipped Screw           |  | S-WD12Z 4.8x38  | TFC36                                   | WDLS 4.8x38                            |
|  | Double boards up to<br>30mm combined<br>thickness to<br>2.0 - 6.0mm steel | 5.5mm Diameter<br>Wafer/CSK Ribbed Head<br>Wing Tipped Screw           |  | S-WD12Z 5.5x85  | TFC80                                   | WDLS 5.5x85                            |

Illustrations supplied courtesy of Ejot

Notes referred to in above table:

(1) Contact the fixing manufacturer for full range of fixing lengths where thickness of material varies.

(2) The Hilti X-U nail has no maximum base steel thickness.

(3) The use of Powder Actuated Nail Fixings must be approved by Metsec for each individual application due to the large range of fixing load capacities.

(4) Screw anchors listed are the shortest available in the range. Longer fixings may be specified by Metsec design.

# External wall load tables

## Maximum height – deflection limited to height/240

| Section Reference | Uniform Horizontal Pressure (kN/m <sup>2</sup> ) |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|-------------------|--|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
|                   | 0.5  | 0.6  | 0.7  | 0.8  | 0.9  | 1.0  | 1.1  | 1.2  | 1.3  | 1.4  | 1.5  | 1.6  | 1.7  | 1.8  | 1.9  | 2.0  |
| 70M15             | 3.41   | 3.21 | 3.05 | 2.92 | 2.80 | 2.71 | 2.62 | 2.55 | 2.48 | 2.42 | 2.36 | 2.31 | 2.27 | 2.22 | 2.18 | 2.15 |
| 100M12            | 4.64   | 4.37 | 4.15 | 3.97 | 3.81 | 3.68 | 3.57 | 3.47 | 3.37 | 3.29 | 3.22 | 3.15 | 3.08 | 3.03 | 2.97 | 2.92 |
| 100M15            | 5.00   | 4.71 | 4.47 | 4.28 | 4.11 | 3.97 | 3.84 | 3.73 | 3.64 | 3.55 | 3.47 | 3.39 | 3.33 | 3.26 | 3.20 | 3.15 |
| 100M20            | 5.49   | 5.17 | 4.91 | 4.70 | 4.52 | 4.36 | 4.22 | 4.10 | 3.99 | 3.90 | 3.81 | 3.73 | 3.65 | 3.58 | 3.52 | 3.46 |
| 150M12            | 6.00   | 5.71 | 5.47 | 5.27 | 5.09 | 4.94 | 4.80 | 4.68 | 4.56 | 4.46 | 4.36 | 4.28 | 4.19 | 4.11 | 4.04 | 3.97 |
| 150M15            | 6.41   | 6.10 | 5.85 | 5.64 | 5.46 | 5.30 | 5.15 | 5.02 | 4.91 | 4.80 | 4.70 | 4.61 | 4.52 | 4.44 | 4.37 | 4.30 |
| 150M20            | 6.94   | 6.61 | 6.34 | 6.12 | 5.92 | 5.76 | 5.60 | 5.47 | 5.35 | 5.24 | 5.13 | 5.04 | 4.95 | 4.86 | 4.79 | 4.71 |
| 200M12            | 6.62   | 6.30 | 6.04 | 5.83 | 5.64 | 5.48 | 5.34 | 5.21 | 5.09 | 4.98 | 4.88 | 4.79 | 4.70 | 4.62 | 4.55 | 4.47 |
| 200M15            | 7.77   | 7.41 | 7.10 | 6.85 | 6.63 | 6.44 | 6.27 | 6.12 | 5.98 | 5.85 | 5.74 | 5.63 | 5.53 | 5.43 | 5.35 | 5.26 |
| 200M20            | 8.49   | 8.09 | 7.76 | 7.49 | 7.26 | 7.05 | 6.87 | 6.71 | 6.56 | 6.43 | 6.30 | 6.19 | 6.08 | 5.98 | 5.89 | 5.80 |
| 250M16            | 8.80   | 8.38 | 8.05 | 7.76 | 7.52 | 7.31 | 7.12 | 6.95 | 6.80 | 6.63 | 6.50 | 6.39 | 6.28 | 6.18 | 6.09 | 6.00 |
| 250M20            | 9.28   | 8.85 | 8.49 | 8.20 | 7.95 | 7.72 | 7.53 | 7.35 | 7.18 | 7.04 | 6.91 | 6.79 | 6.68 | 6.58 | 6.49 | 6.40 |
| 300M20            | 9.02   | 8.61 | 8.27 | 7.98 | 7.74 | 7.53 | 7.34 | 7.17 | 7.01 | 6.87 | 6.74 | 6.62 | 6.51 | 6.41 | 6.32 | 6.23 |
| 300M29            | 10.12  | 9.65 | 9.27 | 8.96 | 8.69 | 8.45 | 8.25 | 8.07 | 7.91 | 7.76 | 7.63 | 7.51 | 7.40 | 7.30 | 7.21 | 7.12 |

## Maximum height – deflection limited to height/360

| Section Reference | Uniform Horizontal Pressure (kN/m <sup>2</sup> ) |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|-------------------|--|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
|                   | 0.5  | 0.6  | 0.7  | 0.8  | 0.9  | 1.0  | 1.1  | 1.2  | 1.3  | 1.4  | 1.5  | 1.6  | 1.7  | 1.8  | 1.9  | 2.0  |
| 70M15             | 2.98   | 2.80 | 2.66 | 2.55 | 2.45 | 2.36 | 2.29 | 2.22 | 2.17 | 2.11 | 2.06 | 2.02 | 1.98 | 1.94 | 1.91 | 1.88 |
| 100M12            | 4.05   | 3.81 | 3.62 | 3.47 | 3.33 | 3.22 | 3.12 | 3.03 | 2.95 | 2.87 | 2.81 | 2.75 | 2.69 | 2.64 | 2.60 | 2.55 |
| 100M15            | 4.37   | 4.11 | 3.90 | 3.73 | 3.59 | 3.47 | 3.36 | 3.26 | 3.18 | 3.10 | 3.03 | 2.96 | 2.90 | 2.85 | 2.80 | 2.75 |
| 100M20            | 4.80   | 4.52 | 4.29 | 4.10 | 3.94 | 3.81 | 3.69 | 3.58 | 3.49 | 3.40 | 3.33 | 3.25 | 3.19 | 3.13 | 3.07 | 3.02 |
| 150M12            | 5.56   | 5.23 | 4.97 | 4.75 | 4.57 | 4.41 | 4.27 | 4.15 | 4.04 | 3.94 | 3.85 | 3.77 | 3.70 | 3.63 | 3.56 | 3.50 |
| 150M15            | 6.00   | 5.64 | 5.36 | 5.12 | 4.93 | 4.76 | 4.61 | 4.48 | 4.36 | 4.25 | 4.15 | 4.07 | 3.98 | 3.91 | 3.84 | 3.77 |
| 150M20            | 6.59   | 6.20 | 5.89 | 5.63 | 5.42 | 5.23 | 5.07 | 4.92 | 4.79 | 4.67 | 4.57 | 4.47 | 4.38 | 4.30 | 4.22 | 4.15 |
| 200M12            | 6.62   | 6.30 | 6.04 | 5.83 | 5.64 | 5.48 | 5.34 | 5.20 | 5.06 | 4.94 | 4.83 | 4.72 | 4.63 | 4.54 | 4.46 | 4.38 |
| 200M15            | 7.75   | 7.29 | 6.92 | 6.62 | 6.37 | 6.15 | 5.96 | 5.78 | 5.63 | 5.50 | 5.37 | 5.26 | 5.15 | 5.05 | 4.96 | 4.88 |
| 200M20            | 8.49   | 8.04 | 7.64 | 7.30 | 7.02 | 6.78 | 6.57 | 6.38 | 6.21 | 6.06 | 5.92 | 5.80 | 5.68 | 5.57 | 5.47 | 5.38 |
| 250M16            | 8.80   | 8.38 | 8.05 | 7.76 | 7.52 | 7.31 | 7.12 | 6.95 | 6.80 | 6.63 | 6.50 | 6.39 | 6.28 | 6.18 | 6.09 | 6.00 |
| 250M20            | 9.28   | 8.85 | 8.49 | 8.20 | 7.95 | 7.72 | 7.53 | 7.35 | 7.18 | 7.04 | 6.91 | 6.79 | 6.68 | 6.58 | 6.49 | 6.40 |
| 300M20            | 9.02   | 8.61 | 8.27 | 7.98 | 7.74 | 7.53 | 7.34 | 7.17 | 7.01 | 6.87 | 6.74 | 6.62 | 6.51 | 6.41 | 6.32 | 6.23 |
| 300M29            | 10.12  | 9.65 | 9.27 | 8.96 | 8.69 | 8.45 | 8.25 | 8.07 | 7.91 | 7.76 | 7.63 | 7.51 | 7.40 | 7.30 | 7.21 | 7.12 |

## Maximum height – deflection limited to height/600

| Section Reference | Uniform Horizontal Pressure (kN/m <sup>2</sup> ) |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|-------------------|--|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
|                   | 0.5  | 0.6  | 0.7  | 0.8  | 0.9  | 1.0  | 1.1  | 1.2  | 1.3  | 1.4  | 1.5  | 1.6  | 1.7  | 1.8  | 1.9  | 2.0  |
| 70M15             | 2.51   | 2.36 | 2.25 | 2.15 | 2.06 | 1.99 | 1.93 | 1.88 | 1.83 | 1.78 | 1.74 | 1.70 | 1.67 | 1.64 | 1.61 | 1.58 |
| 100M12            | 3.42   | 3.22 | 3.06 | 2.92 | 2.81 | 2.71 | 2.63 | 2.55 | 2.48 | 2.42 | 2.37 | 2.32 | 2.27 | 2.23 | 2.19 | 2.15 |
| 100M15            | 3.68   | 3.47 | 3.29 | 3.15 | 3.03 | 2.92 | 2.83 | 2.75 | 2.68 | 2.61 | 2.55 | 2.50 | 2.45 | 2.40 | 2.36 | 2.32 |
| 100M20            | 4.05   | 3.81 | 3.62 | 3.46 | 3.33 | 3.21 | 3.11 | 3.02 | 2.94 | 2.87 | 2.80 | 2.74 | 2.69 | 2.64 | 2.59 | 2.55 |
| 150M12            | 4.69   | 4.41 | 4.19 | 4.01 | 3.85 | 3.72 | 3.60 | 3.50 | 3.41 | 3.33 | 3.25 | 3.18 | 3.12 | 3.06 | 3.00 | 2.95 |
| 150M15            | 5.06   | 4.76 | 4.52 | 4.32 | 4.15 | 4.01 | 3.89 | 3.77 | 3.67 | 3.58 | 3.50 | 3.43 | 3.36 | 3.30 | 3.24 | 3.18 |
| 150M20            | 5.56   | 5.23 | 4.97 | 4.75 | 4.57 | 4.41 | 4.27 | 4.15 | 4.04 | 3.94 | 3.85 | 3.77 | 3.69 | 3.62 | 3.56 | 3.50 |
| 200M12            | 5.87   | 5.52 | 5.25 | 5.02 | 4.83 | 4.66 | 4.51 | 4.38 | 4.27 | 4.16 | 4.07 | 3.98 | 3.90 | 3.83 | 3.76 | 3.70 |
| 200M15            | 6.53   | 6.15 | 5.84 | 5.58 | 5.37 | 5.18 | 5.02 | 4.88 | 4.75 | 4.63 | 4.53 | 4.43 | 4.34 | 4.26 | 4.18 | 4.11 |
| 200M20            | 7.21   | 6.78 | 6.44 | 6.16 | 5.92 | 5.72 | 5.54 | 5.38 | 5.24 | 5.11 | 5.00 | 4.89 | 4.79 | 4.70 | 4.62 | 4.54 |
| 250M16            | 8.04   | 7.56 | 7.18 | 6.87 | 6.61 | 6.38 | 6.18 | 6.00 | 5.84 | 5.70 | 5.57 | 5.45 | 5.32 | 5.21 | 5.11 | 5.02 |
| 250M20            | 8.63   | 8.12 | 7.72 | 7.38 | 7.10 | 6.85 | 6.64 | 6.45 | 6.28 | 6.12 | 5.99 | 5.86 | 5.74 | 5.63 | 5.53 | 5.44 |
| 300M20            | 9.02   | 8.61 | 8.27 | 7.98 | 7.74 | 7.53 | 7.34 | 7.17 | 7.01 | 6.87 | 6.74 | 6.62 | 6.51 | 6.41 | 6.32 | 6.23 |
| 300M29            | 10.12  | 9.65 | 9.27 | 8.96 | 8.69 | 8.45 | 8.25 | 8.07 | 7.91 | 7.76 | 7.63 | 7.51 | 7.40 | 7.30 | 7.21 | 7.12 |

Maximum heights in above External walling tables based on:

1. Unfactored horizontal pressure.
2. Maximum external cladding weight of 0.50kN/m<sup>2</sup>.
3. Blocking and strapping at mid height.
4. Studs at 600mm centres.

5. Studs fixed into 1.2mm base track.

6. 100mm, 150mm and 200mm studs fixed to Metsec Slotted Deflection Head Track.

7. 70mm, 250mm and 300mm studs fixed at head using standard 2.0mm head track with blocking and strapping detail.



### High Bay/Internal Walling load table

For uniform horizontal pressures greater than 0.45kN/m<sup>2</sup> use external walling tables.

Where height exceeds practical rolling length a splice detail will be required. If this is the case consult our technical department.

| Section Reference | Uniform Horizontal Pressure (kN/m <sup>2</sup> ) at Joist Spacing (mm) |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|-------------------|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                   | 0.10   |       | 0.15  |       | 0.20  |       | 0.25  |       | 0.30  |       | 0.35  |       | 0.40  |       | 0.45  |       |
|                   | 400  | 600   | 400   | 600   | 400   | 600   | 400   | 600   | 400   | 600   | 400   | 600   | 400   | 600   | 400   | 600   |
| 70M15             | 6.69   | 5.84  | 5.84  | 5.10  | 5.31  | 4.63  | 4.93  | 4.30  | 4.63  | 4.05  | 4.40  | 3.84  | 4.21  | 3.68  | 4.05  | 3.53  |
| 100M12            | 9.09   | 7.94  | 7.94  | 6.94  | 7.22  | 6.30  | 6.70  | 5.85  | 6.30  | 5.51  | 5.99  | 5.23  | 5.72  | 5.00  | 5.51  | 4.81  |
| 100M15            | 9.80   | 8.56  | 8.56  | 7.47  | 7.77  | 6.79  | 7.22  | 6.30  | 6.79  | 5.93  | 6.45  | 5.63  | 6.17  | 5.39  | 5.93  | 5.18  |
| 100M20            | 10.76  | 9.40  | 9.40  | 8.21  | 8.54  | 7.46  | 7.93  | 6.92  | 7.46  | 6.52  | 7.08  | 6.19  | 6.78  | 5.92  | 6.51  | 5.69  |
| 150M12            | 12.47  | 10.89 | 10.89 | 9.51  | 9.89  | 8.64  | 9.18  | 8.02  | 8.64  | 7.55  | 8.21  | 7.17  | 7.85  | 6.86  | 7.55  | 6.59  |
| 150M15            | 13.44  | 11.74 | 11.74 | 10.25 | 10.67 | 9.32  | 9.90  | 8.65  | 9.32  | 8.14  | 8.85  | 7.73  | 8.46  | 7.39  | 8.14  | 7.11  |
| 150M20            | 14.77  | 12.90 | 12.90 | 11.27 | 11.72 | 10.24 | 10.88 | 9.51  | 10.24 | 8.95  | 9.73  | 8.50  | 9.30  | 8.13  | 8.95  | 7.81  |
| 200M12            | 15.61  | 13.63 | 13.63 | 11.91 | 12.39 | 10.82 | 11.50 | 10.04 | 10.82 | 9.45  | 10.28 | 8.98  | 9.83  | 8.59  | 9.45  | 8.26  |
| 200M15            | 17.36  | 15.17 | 15.17 | 13.25 | 13.78 | 12.04 | 12.79 | 11.18 | 12.04 | 10.52 | 11.44 | 9.99  | 10.94 | 9.55  | 10.52 | 9.19  |
| 200M20            | 19.15  | 16.73 | 16.73 | 14.61 | 15.20 | 13.28 | 14.11 | 12.33 | 13.28 | 11.60 | 12.61 | 11.02 | 12.06 | 10.54 | 11.60 | 10.13 |
| 250M16            | 20.00  | 18.66 | 18.66 | 16.30 | 16.95 | 14.81 | 15.74 | 13.75 | 14.81 | 12.93 | 14.07 | 12.29 | 13.45 | 11.75 | 12.93 | 11.30 |
| 250M20            | 20.00  | 20.00 | 20.00 | 17.51 | 18.21 | 15.91 | 16.90 | 14.77 | 15.91 | 13.89 | 15.11 | 13.20 | 14.45 | 12.62 | 13.89 | 12.14 |
| 300M20            | 20.00  | 20.00 | 20.00 | 19.77 | 20.00 | 17.96 | 19.08 | 16.67 | 17.96 | 15.69 | 17.06 | 14.90 | 16.32 | 14.25 | 15.69 | 13.70 |
| 300M29            | 20.00  | 20.00 | 20.00 | 20.00 | 20.00 | 20.00 | 20.00 | 18.91 | 20.00 | 17.80 | 19.35 | 16.91 | 18.51 | 16.17 | 17.80 | 15.55 |

Maximum heights in above High Bay / Internal Walling table based on:

1. Unfactored horizontal pressure.
2. Deflection limited to height/240.
3. Blocking and strapping at mid height.
4. Studs are boarded with a minimum of one layer of 12.5mm (min) plasterboard to both sides.
5. Studs fixed into 1.2mm base track.
6. 100mm, 150mm and 200mm studs fixed to Metsec Slotted Deflection Head Track.
7. 70mm, 250mm and 300mm studs fixed at head using standard 2.0mm head track with blocking and strapping detail.

### Joist load tables

| Section Reference | Uniform Load (kN/m <sup>2</sup> ) at Joist Spacing (mm) |             |             |             |             |             |             |             |             |             |             |             |             |             |             |             |
|-------------------|---|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
|                   | Ceiling Joists  |             |             |             |             |             |             |             | Roof Joists |             |             |             |             |             |             |             |
|                   | Dead / Live   |             | Dead / Live |             | Dead / Live |             | Dead / Live |             | Dead / Live |             | Dead / Live |             | Dead / Live |             | Dead / Live |             |
|                   | 0.25 / 0.25   | 0.50 / 0.25 | 0.50 / 0.25 | 0.25 / 1.50 | 0.50 / 1.50 | 0.50 / 1.50 | 0.50 / 1.50 | 0.70 / 0.60 | 1.20 / 0.60 | 1.20 / 0.60 | 0.70 / 1.50 | 0.70 / 1.50 | 1.20 / 1.50 | 1.20 / 1.50 | 1.20 / 1.50 | 1.20 / 1.50 |
|                   | 400   | 600         | 400         | 600         | 400         | 600         | 400         | 600         | 400         | 600         | 400         | 600         | 400         | 600         | 400         | 600         |
| 150M12            | 7.10  | 5.79        | 5.86        | 5.29        | 4.41        | 3.85        | 4.39        | 3.83        | 5.05        | 4.47        | 4.61        | 4.05        | 4.27        | 3.71        | 4.01        | 3.46        |
| 150M15            | 8.00  | 6.55        | 6.63        | 5.67        | 4.76        | 4.15        | 4.72        | 4.15        | 5.42        | 4.82        | 4.96        | 4.38        | 4.60        | 4.03        | 4.34        | 3.77        |
| 150M20            | 8.00  | 7.61        | 7.69        | 6.50        | 5.23        | 4.57        | 5.16        | 4.57        | 5.88        | 5.25        | 5.40        | 4.80        | 5.03        | 4.44        | 4.75        | 4.18        |
| 200M12            | 8.52  | 6.96        | 7.04        | 5.95        | 5.08        | 4.50        | 4.90        | 4.33        | 5.60        | 5.00        | 5.14        | 4.56        | 4.78        | 4.22        | 4.52        | 3.96        |
| 200M15            | 10.00   | 9.31        | 9.41        | 7.68        | 5.97        | 5.29        | 5.77        | 5.10        | 7.08        | 5.87        | 6.07        | 5.36        | 5.62        | 4.96        | 5.31        | 4.66        |
| 200M20            | 10.00   | 10.00       | 10.00       | 9.04        | 6.78        | 5.83        | 6.33        | 5.63        | 8.34        | 6.81        | 7.15        | 5.90        | 6.32        | 5.48        | 5.85        | 5.17        |
| 250M16            | 13.27   | 11.59       | 11.59       | 9.63        | 7.46        | 6.09        | 7.02        | 5.84        | 8.88        | 7.25        | 7.61        | 6.21        | 6.73        | 5.69        | 6.12        | 5.37        |
| 250M20            | 14.26   | 12.45       | 12.45       | 10.67       | 8.12        | 6.75        | 7.79        | 6.36        | 9.84        | 8.04        | 8.44        | 6.89        | 7.46        | 5.94        | 6.79        | 5.72        |
| 300M20            | 15.00   | 12.52       | 12.66       | 10.34       | 8.01        | 6.54        | 7.54        | 6.16        | 9.53        | 7.78        | 8.17        | 6.67        | 7.22        | 6.09        | 6.57        | 5.64        |
| 300M29            | 15.00   | 15.00       | 15.00       | 12.84       | 9.95        | 8.12        | 9.37        | 7.65        | 11.84       | 9.67        | 10.15       | 8.29        | 8.97        | 7.32        | 8.16        | 6.66        |

| Section Reference | Uniform Load (kN/m <sup>2</sup> ) at Joist Spacing (mm) |             |             |             |             |             |             |             |                       |             |             |             |             |             |             |             |
|-------------------|---|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-----------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
|                   | Without Acoustic Overlay                                |             |             |             |             |             |             |             | With Acoustic Overlay |             |             |             |             |             |             |             |
|                   | Dead / Live   |             | Dead / Live |             | Dead / Live |             | Dead / Live |             | Dead / Live           |             | Dead / Live |             | Dead / Live |             | Dead / Live |             |
|                   | 0.50 / 1.50   | 0.75 / 1.50 | 0.75 / 1.50 | 0.50 / 3.00 | 0.75 / 5.00 | 0.75 / 5.00 | 0.75 / 5.00 | 1.00 / 1.50 | 1.25 / 1.50           | 1.25 / 1.50 | 1.00 / 2.00 | 1.00 / 2.00 | 1.00 / 3.00 | 1.00 / 3.00 | 1.00 / 3.00 | 1.00 / 3.00 |
|                   | 400   | 600         | 400         | 600         | 400         | 600         | 400         | 600         | 400                   | 600         | 400         | 600         | 400         | 600         | 400         | 600         |
| 150M12            | 3.64  | 3.53        | 3.64        | 3.40        | 3.25        | 2.24        | 2.04        | 1.36        | 3.65                  | 3.24        | 3.50        | 2.97        | 3.53        | 2.68        | 2.98        | 1.98        |
| 150M15            | 3.86  | 3.80        | 3.86        | 3.66        | 3.50        | 2.84        | 2.59        | 1.73        | 3.87                  | 3.49        | 3.70        | 3.34        | 3.79        | 3.33        | 3.46        | 2.52        |
| 150M20            | 4.17  | 4.10        | 4.17        | 3.96        | 3.85        | 3.36        | 3.25        | 2.76        | 4.15                  | 3.75        | 3.97        | 3.59        | 4.07        | 3.66        | 3.80        | 3.32        |
| 200M12            | 4.36  | 4.29        | 4.36        | 4.12        | 4.07        | 3.51        | 3.36        | 2.31        | 4.32                  | 3.91        | 4.14        | 3.74        | 4.24        | 3.83        | 4.02        | 3.31        |
| 200M15            | 4.76  | 4.68        | 4.76        | 4.46        | 4.53        | 3.95        | 3.82        | 2.87        | 4.68                  | 4.23        | 4.48        | 4.05        | 4.60        | 4.15        | 4.45        | 3.91        |
| 200M20            | 5.16  | 5.07        | 5.16        | 4.81        | 5.00        | 4.36        | 4.21        | 3.68        | 5.04                  | 4.56        | 4.82        | 4.36        | 4.95        | 4.47        | 4.79        | 4.31        |
| 250M16            | 5.66  | 5.56        | 5.66        | 5.22        | 5.57        | 4.78        | 4.36        | 2.90        | 5.47                  | 4.94        | 5.24        | 4.73        | 5.37        | 4.85        | 5.20        | 4.24        |
| 250M20            | 6.03  | 5.89        | 6.03        | 5.50        | 5.89        | 5.23        | 5.05        | 4.23        | 5.77                  | 5.22        | 5.53        | 4.99        | 5.67        | 5.12        | 5.48        | 4.95        |
| 300M20            | 6.76  | 6.45        | 6.67        | 6.03        | 6.59        | 5.90        | 5.70        | 4.23        | 6.32                  | 5.71        | 6.05        | 5.47        | 6.21        | 5.61        | 6.00        | 5.42        |
| 300M29            | 7.81  | 7.09        | 7.33        | 6.63        | 7.25        | 6.55        | 6.35        | 4.23        | 6.95                  | 6.28        | 6.65        | 6.01        | 6.82        | 6.17        | 6.06        | 5.96        |

Maximum spans in above Joist load tables based on:

1. Unfactored dead and live loads.
2. Imposed load deflection limited to span/450 for floors and span/360 for other conditions.
3. Dead + Imposed load deflection limited to span/350 for floors and span/200 for other conditions.
4. Blocking and strapping at mid span for spans < 6.0m. For spans over 6.0m blocking and strapping required at max 3.0m spacing.
5. Floor joists boarded with minimum 15mm plywood for joists at 400mm centres or 18mm plywood for joists at 600mm centres.
6. Boarding fixed to the joists at maximum 300mm centres.
7. Joists fixed into 2.0mm gauge tracks at each end.

# Services and general notes

Metsec's team of Structural Engineers can produce project specific panel drawings when supplied with the Architect's and Structural Engineer's drawings. These panel drawings provide the design team with the structural sizes and sufficient detail to appreciate how the SFS framing will be fixed back to the primary structure.

This information can also be used by potential Sub-Contractors to provide budget rates for Main Contractors.

## Customer service

Metsec are committed to providing the highest levels of customer satisfaction and ensure that our staff are trained to the highest possible levels in order to assist our customers at all stages of the design and installation process.

Our technical sales teams in particular have a thorough knowledge of our products and will aim to resolve your questions quickly and professionally.

## Detailing service

Metsec can also offer a complete detailing service. Working from Architects' and Structural Engineers' drawings, Metsec's team of engineers and specialist draughtsmen will produce structural layouts and section drawings to assist the site team.

Typical elevation produced by the Metsec SFS drawing office

## Research and development

Metsec operate a policy of continuous research and development, ensuring that products meet our customer needs.

## Company Registration

Metsec plc.

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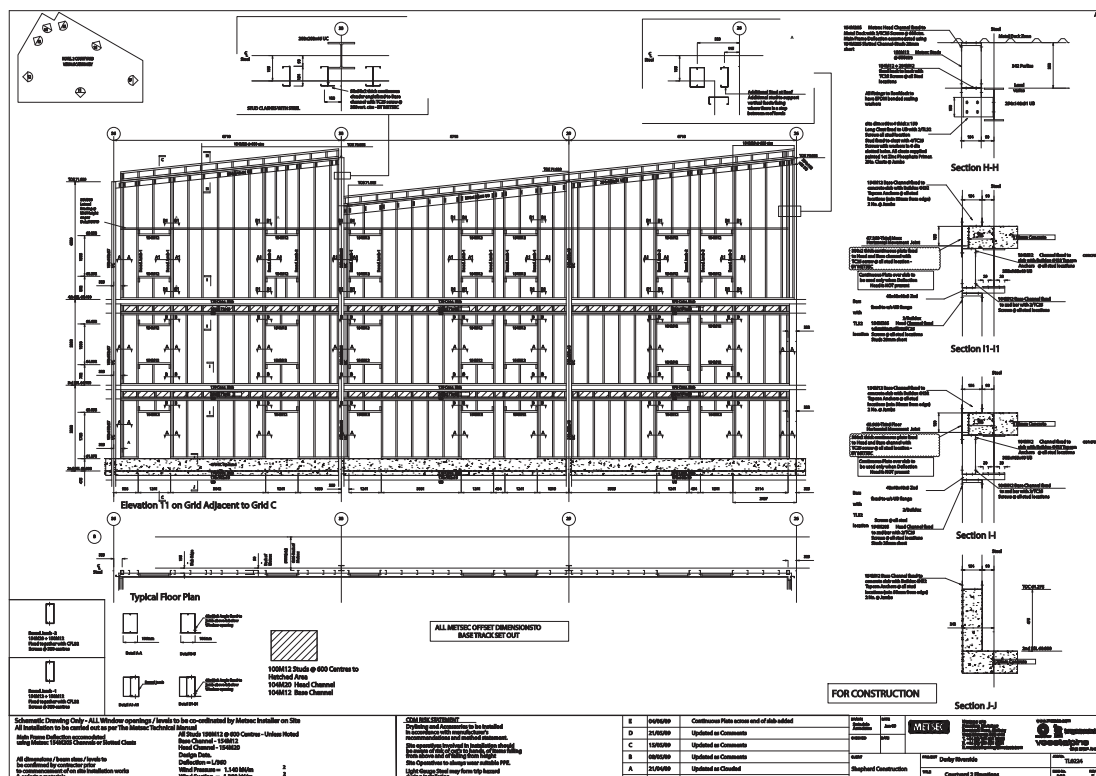
Company Number: 1551970 (England)

## CPD



The Metsec SFS Division offers a continuous professional development presentation which has been accredited by the Construction CPD Certification

Service in the use and application of Metsec products and FrameSPEC design software. CPDs can easily be arranged by contacting the Metsec SFS Division on 0121 601 6000 or by visiting [www.metsec.com](http://www.metsec.com).

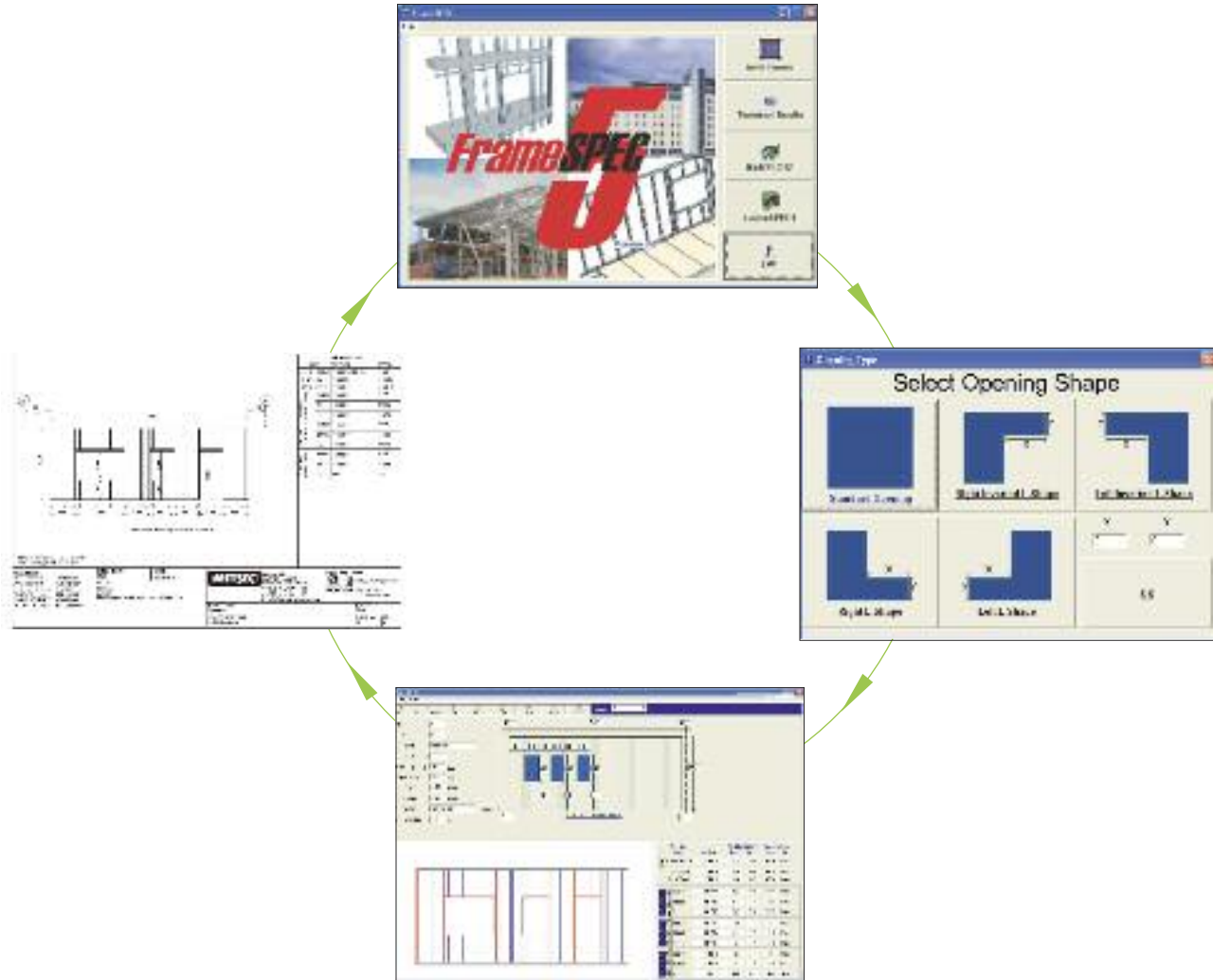


# Software

Metsec are pioneers when it comes to the provision of design software packages. Our first package for SFS was produced in 1998 and since then the software has been continually updated and improved. Today, FrameSPEC enables the user to calculate the wind loads to the local building zones before allowing quick and easy design of the SFS Framing.

The final design is presented through a series of panel drawings together with all relevant connection details.

For a free copy of the latest FrameSPEC software please contact Metsec on 0121 601 6000 or visit our website: [www.metsec.com](http://www.metsec.com)



Note: Metsec reserve the rights to change the specification for products in this literature without prior notice

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